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Mathematics and Electronics in the Service of Planning

An Inter-Branch Economic Balance For an Economic Area

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The Present Stage of Economic Competition Between the USSR and the Chief Capitalist Countries

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SELECTED ARTICLES FROM SOVIET ECONOMICS JOURNALS IN ENGLISH TRANSLATION

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Planovoe Khoziaistvo (Planned Economy)
Mirovaia Ekonomika i Mezhdunarodnye Otnosheniia (World Economy and International Relations)
Ekonomicheskaia Gazeta (Economic Gazette)
Vestnik Statistiki (Journal of Statistics)
Sotsialisticheskii Trud (Socialist Labor)
Biulleten' Nauchnoi Informatsii. Trud i Zarabotnaia Plata (Bulletin of Scientific Information. Labor and Wages)
Vneshniaia Torgovlia (Foreign Trade)
Vestnik Leningradskogo Universiteta, Seriia Ekonomiki (Journal of Leningrad University, Economic Series)
Vestnik Moskovskogo Universiteta, Seriia Ekonomiki (Journal of Moscow University, Economic Series)
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National Economic Planning

Planovoe Khoziaistvo, 1961, No. 3

Nemchinov

ATHEMATICS AND ELECTRONICS IN THE SERVICE OF PLANNING

The powerful advance of the socialist economy
s confronted Soviet economists and mathemati-
ans with new tasks in improving planning calcula-
n and working out economic and mathematical
ethods of measuring rates of growth and national
onomic proportions.

The rapid development of the socialist economy
lls for new methods of solving complex problems
countered in planning the national economy. Ac-
rdingly, a new applied scientific discipline has de-
loped on the borders of political economy, branch
onomics, statistics, mathematics and planning.
e main purpose of this branch of knowledge is to
rk out and improve the economic and mathemati-
l methods of studying and constructing various
onomic models which lend themselves to mathe-
atical treatment.

The origins of this new applied scientific disci-
ne can actually be traced to the very first years
Soviet power. The world's first balance of the
viet national economy (1923/1924), incorporating
nodel of inter-branch production ties for prod-
ts and implements of labor, was drawn up in 1925-
26. The need for factory planning from below
ve rise to new mathematical methods of planning
oduction (1939) in order to pose and solve eco-
mic and mathematical problems involving the
lest use of mechanisms, the rational use of raw
aterials, fuel, etc.

A variety of needs have recently given rise to new
lds in mathematics, such as mathematical pro-
amming, operations research, the theory of stra-
gic games and machine mathematics.

In economics the balance method of planning has
en further developed and a number of new techni-
es for studying quantitative interdependencies have
peared. All these economic investigations are de-
loping and improving on the theoretical basis of
arxist-Leninist political economy.

Quantitative regularities are approached within
e theoretical framework of the political economy
socialism. Special techniques of mathematical
alysis of quantitative economic regularities make
the content of, on the one hand, mathematical statistics (multiple correlation, indices, etc.), and on the other, econometrics (optimum programming, mathematical economic models, the vectorial-matrix method of economic analysis, elasticity measurement, planning calculation theory).

Under socialist conditions econometrics develops differently in principle than under capitalism. In many respects it develops as planometrics (planometriie — trans.), aimed as it is at assisting the directing and planning agencies in their active control of the country's economic development. Most of the problems facing Soviet econometrics are closely connected with planning the national economy and the mathematical economic analysis of models of the planned economy.

The application of mathematics and electronics in economics, just as in any other science, involves the construction and investigation of various models simulating objective processes and phenomena. In economics these are, for example, various national economic models consisting of sets of mathematical economic characteristics describing the most important features and properties of the national economy conceptualized into a certain system. By way of illustration, we can mention models of socialist expanded reproduction, inter-branch production ties, capital investment, material supply, national consumption, etc.

A mathematical economic model reproduces numerically a number of planned and reported indices coordinated into a system of equations. In addition to national economic indices and systems of equations the model incorporates (as inequalities) a number of restrictions, for example, on capital investment, raw materials in short supply, production capacities, etc.

Some models are used to obtain numerical solutions assigned by a set of equations and limited by certain inequalities. Models perform this role whever estimates are needed to derive optimum solutions for given restrictions and under given conditions.

As sets of indices, equations and inequalities, mathematical economic models are essential for a many-sided economic analysis, as well as for conducting many complex economic and planning calculations to obtain an optimum solution. The use of electronic computers for the numerical treatment of these models cuts the time needed for these calculations to a minimum and ensures a high degree of accuracy.

Many models are essentially based on a matrix of norms describing the interdependence of spheres and branches of the national economy. The matrix is a rectangular table with the numbers reflecting, for example, streams of material values (fuel, raw materials and other objects of labor) and production services (for transportation, maintenance, etc.) among individual branches and enterprises.

The matrix construction is characteristic not only of general national-economic, but also of enterprise-level models. Stimulating experiences of constructing matrix models of the technical-industrial-financial plan for certain chemical enterprises were discussed in several reports delivered at the Inter-Higher-School Scientific Conference for Reorganization of Factory-Level Planning through the Use of Mathematical Techniques and Electronic Computers convened by the Moscow Engineering-Economic Institute in December 1960. Similar investigations are in progress in the machine-building and other industries.

These experiments have shown that the matrix construction of the technical-industrial-financial plan has several advantages, the chief of these being the possibility of recalculating the entire technical-industrial-financial plan should any output target be altered. The lower-level technical-industrial-financial plan constructed as a matrix model can be coordinated with a system of plan balances for materials and over-all value balances drawn up by economic councils and planning agencies.

Using modern mathematical techniques and electronic computers it is easy to combine the matrix models for technical-industrial-financial plans into an integrated regional or republican over-all inter-branch or inter-district plan for production and distribution. Though unbalanced at the outset, this plan can easily be recalculated in keeping with the plan directives and limits, and simultaneously balanced because of the advantages of matrix construction. It is possible to calculate several variants of the plan satisfying the principal directives and taking account of the restrictions on resources, but differing in the methods of their realization. From these variants the optimum variant satisfying definite economic criteria set in advance can be selected. It is important that the application of mathematical methods of programming dispenses with the need for testing all possible variants of the plan, since there are general mathematical techniques ensuring the selection of the optimum variant wit out having to determine directly all possible variants.

Consequently, the application of modern mathematical methods and electronic computers makes it possible to release planning personnel from labor-consuming economic and planning calculatio of all kinds and to concentrate on the solution of the principal problems of planning and organizin the national economy.

The matrix construction of the technical-industrial-financial plan and material balance makes it possible, in particular, to put in order t system of summarizing and processing different planning norms underlying the technical-industri financial plans, material balances, and inter-branch balances of production and distribution.

The proper organization of the complicated arr of norms is of great importance for planning. O of the principal problems in this field is the elaboration of consolidated standard norms for planning purposes on the basis of the available technological specifications. Since each consolidated standard norm changes its structure depending o its application, modern machine-calculation techniques cannot be dispensed with in determining these norms requiring complex repeated calculations. The Computer Center of the State Econom Council of the USSR is already dealing with this major problem of improving the apparatus of setting norms for use in planning.

Of special importance for improving planning and accounting are the standard norms of mater supply, also requiring careful investigation and generalization.

In this respect we already have the very interesting experience of the Industrial Enterprises Administration of the Ministry of Communicatio of the USSR. The Ministry has decided to mechanize the planning calculations for supplying its factories with materials and equipment. The fa tories no longer have to draw up special orders for the needed products and materials, since the calculations have been centralized and are now p formed with alphabet card-punching computers (the Bull type) in which is set a constant mass of standard norm cards. The latter are based on r adjusted technological specifications for the normal expenditures of raw materials and parts fo the entire range of products produced by the factories of the ministry.

The standard punched-card material is used f making up each factory's orders for material-technical supply as well as an over-all order co prising all industrial enterprises of the ministr

arterly accounts of material-technical supply,
h allowances for readjusted quarterly plans, are
o used for operational planning. One copy of an
ler is sent to a factory and another to the mate-
l-supply agency. Under this scheme the time
eded to draw up requests for materials is cut to
3 or 1/4 of the former time needed and the amount
calculations to 2/5 or 1/3.

Each economic council can carry out similar ma-
ial-technical supply planning calculations for all
erprises and thereby relieve engineering-
hnical personnel and other specialists from a
st amount of calculations which are actually noth-
; but the multiplication of the norms of expendi-
e by the amounts planned and the summation of
products obtained. Besides, the efficiency and
ality of planning will improve since it now be-
mes possible to readjust the calculations whenever
output program changes.

The calculations are based on sets of norm cards,
nched for technically substantiated progressive
rms of expenditure of materials and individual-
d, if necessary, for factories under special con-
ions.

Under the above system of calculations for mate-
l-technical supply planning, individual plans can
summarized into a general planning model of the
pply of materials in the form of planned and re-
rted summary material balances, both for an
onomic administrative area and the country's na-
nal economy as a whole.

This organization of planning calculations for
terial-technical supply also makes it possible to
nstruct a general, material supply model as a
nned and reported over-all material balance for
economic council, a republic and the entire na-
nal economy.

Economic councils and factories could also use
imum programming techniques and modern com-
ing equipment to solve a broad range of different
ustrial problems, such as the rational cutting of
terials, the selection of doses in preparing chem-
l products, the optimum loading of machine tools,
ipment, means of transportation, etc. Any enter-
se faces problems of this kind whenever a plan or
order is distributed among the workshops or the
ferent units and machine tools inside a workshop.
economic council is also confronted with such
blems whenever a production program is dis-
buted among its enterprises. The problem in all
hese cases usually involves a distribution of a
n or an order which would ensure the fulfillment
he entire program either within the shortest
iod possible and with the lowest expenditure of
chine time, or at lowest cost, etc.

The application of mathematical methods for
solving such problems has been spreading in our country. Working in this field are the mathematical economics laboratories at the Moscow Region Economic Council, Moscow Engineering-Economic Institute, Leningrad State University, as well as some other economic councils and large industrial enterprises.

The inter-branch model of the national economy is of special importance for national economic planning. Usually the model is constructed as an inter-branch balance of production and distribution and incorporates a set of linear balance equations with restrictions in the form of corresponding mathematical inequalities.

A summary material and value balance is constructed for all enterprises in the inter-branch balance. The central section of the inter-branch balance is the chessboard table of reciprocal production flows of goods and products. The horizontal lines of this table incorporate information on the distribution of output (deliveries) of each kind of production designated at the beginning of the line. Vertical columns indicate the commodity composition of the materials expended in the branch designated at the top of the column.

The inter-branch model is based on a matrix of standard norms in the form of technological expenditure coefficients for fuel, raw materials, electric power, etc. per unit of product in each given branch, as well as in the form of capital expenditures per unit of growth in production.

The inter-branch model of production and distribution can be used for calculating the major national economic proportions (for example, the relationship between the consumption fund and the accumulation fund, necessary and surplus product, national income and the fund for compensating material expenditures, etc.), as well as for determining major economic criteria (for example, the rate of economic growth, a profitability norm, a capital investment effectiveness coefficient, etc.).

These national economic proportions and economic criteria are determined from the sections of the inter-branch balance providing for the calculation of the final social product in the form of the material composition of the national income, as well as the newly created value and its elements (the fund of payment for labor and the value of the surplus product).

Filling in the details of the inter-branch balance model makes it possible to choose the optimum plan variant by relying on a system of technological and production equations and special-purpose functions. The optimum plan balance should satisfy definite criteria. The latter can be formulated as qualitative assignments or definite special-purpose functions satisfying maximum or minimum requirement (depending on the nature of the economic phenomenon described by the function). If the function characterizes, for example, the physical volume of final social product, the maximum requirement comes into play, and if the function describes costs or expenditures of labor per unit of product, the function is reduced to the minimum.

Qualitative assignments are taken into account when the balance itself is constructed. For example, the plan balance provides for the most rational assortment of products. The balance contemplates technological processes which are feasible, more advanced technically and conducive to the best conditions of work. These processes are given as much prominence as possible in the plan. Use is also made of the most rational technological expenditure coefficients approved by experts in the field. Account is also taken of forthcoming changes in wages (the increase in wages of low-paid employees, for example). Finally, the plan is always directed toward the fulfillment of the assigned rate of growth of individual branches and the national economy as a whole.

Constructed along these lines, the base inter-branch balance is then subjected to additional economic and mathematical treatment to bring out — using optimum programming methods (the resolving multipliers method, the simplex method and the vectorial-matrix method, for example) — the optimum variant, which differ from the base plan only in the method of realization of the assignment. The above methods are used, above all, for the selection of the best combination of technological methods from the standpoint of a certain criterion and for given restrictions. For example, the best combination of coal mining methods (open, closed, hydraulic) and areas can be selected with the aid of linear programming methods. These methods can also be used to obtain the best combination of electric power generation methods (different kinds of fuel, hydropower, etc.) for existing and planned enterprises. Certain restrictions can be taken into account in the problem; for example, the plan limit for resources, capital investment, or the over-all planned volume of final product. The special-purpose function describing the minimum of national economic expenses (production cost plus capital investment, with allowance for the latter's planned profitability) determines the best combination of coal mining or power generation methods.

The choice of the best combination of technological methods can be made for several key branches. It is especially important for the balance of different kinds of fuel (taking account of major basins and deposts) and the electric energy balance (taking account of the capacities of the stations and thei types).

The selection of the optimum combination of technological methods determines the average te nological expenditure coefficients for the optimu program which are selected for each kind of pro duction, with the current technological charts an production estimates taken into account. These average technological expenditure coefficients a reflected numerically in the optimum inter-bran plan balance.

Similar methods are used for the selection of the optimum combination of supplies from foreig and domestic sources for the kinds of production in which imports figure prominently along with d mestic products. This selection of the optimum supply program determines the import coefficie introduced in the plan balance.

It is appropriate to apply mathematical econo techniques not only at individual stages of select the optimum plan variant, but also for appraisin the plan balance as a whole.

The inter-branch plan balance makes it possib to choose the optimum national economic rate of profitability and the optimum coefficient of what known as "economic expansion." The latter indicates the ratio of the value of gross social produ to that of the products and services expended in the sphere of production (including the material elements of the consumption fund of the populati engaged in material production). The problem c be solved using the method of mathematical mul pliers and introducing special appraisal indices for technological methods of production (intensities) and for products (balance estimates).

Several organizations are working on the construction of the inter-branch model. The Centr Statistical Administration of the USSR has draw up an inter-branch account of production and dis tribution for 1959. The Laboratory of Mathemat cal Economic Methods of the Academy of Scienc of the USSR has worked out similar balances fo certain economic administrative areas. The Ec nomic Research Institute and the Computer Cen of the State Economic Council of the USSR are working on an inter-branch plan balance incorporating an over-all plan balance for materials. All these investigations make it possible to car out the experimental mathematical economic tre ment of statistical and plan data with a view to i proving the methods of planning through the use electronic computers.

The matrix construction of an inter-branch model of the national economy permits the calc tion of total expenditures of working time and t payments for labor. For this purpose a vector-

introduced in the model in the form of specific
orms (calculated per unit of product) of expendi-
re of working time or specific rates of payment
wages. These total expenditures of working time
ill be socially necessary expenditures of labor in-
smuch as the expenditures of working time are
etermined according to the optimum plan variant
d are balanced against each other and coordi-
ted.

The inter-branch plan balance can also be used
r constructing a model of planned price formation.
or this purpose it is important to calculate so-
ally necessary expenditures of working time and
tal (throughout the production vertical sections)
age payments (work units in the collective farm
ector). Research is now in progress to construct
fferent models of planned price formation. In the
aboratory of Mathematical Economic Methods of
e Academy of Sciences of the USSR work is under
ay on a model of planned price formation on the
sis of value. The Institute of Electronic Com-
ters of the Academy of Sciences of the USSR has
orked out a price formation model based on prices
production and the planning of profitability in per-
ntages of the sum of fixed and current assets.
e same institute is concerned with the experimen-
l checking of other schemes of planned price for-
ation.

Scientifically substantiated planning of capital in-
stments is of immense importance for the na-
onal economy. It is a well-known fact that the de-
elopment of the entire national economy and its in-
vidual branches depends essentially on the volume,
ructure and distribution of capital investments.
etween the rate of growth of gross social product,
e physical volume of national income, and fixed
d current assets, there are definite quantitative
terconnections on which the model of capital in-
stments is usually based.

Underlying this model are the matrices of capital
vestment coefficients describing capital invest-
ent per unit of growth of output. These coeffici-
ts are connected in a certain way with the capital-
tput ratio and what is known as "capital yield."
e latter is an inverse index of the capital-output
tio and describes the ratio of output to the value
fixed assets. The connection between the capital
vestment coefficients and the capital-output ratio
determined by the fact that the planned capital
vestment per unit of growth of output does not ex-
ed — by virtue of the economic and technical
ogress in each branch — the average capital-
tput ratio achieved for the given kind of product.

As a rule, capital investments can be regarded as
onomically profitable if they do not exceed (if cal-
lated per unit of growth of output) the current average branch capital-output ratio for a particular kind of product. The development of more capital-consuming branches, however, can lead to higher capital consumption in producing final output or in the physical volume of the national income.

The capital-output ratio for different kinds of assets (for example, industrial structures, power equipment and motors, machine tools, mechanisms, etc.) is sometimes used in the construction of the capital investment model. Machines, machine tools and motors are the most active factors in production. Therefore, an increase in their relative share in fixed assets is, as a rule, accompanied by a reduction in the capital-output ratio.

The capital investment model provides for an inter-branch matrix of a stream of capital expenditures (deliveries of equipment, industrial construction, capital expenditures on the growth of industrial stocks of minerals, on the increase of arable land due to irrigation, watering, land improvement, etc.). Apart from the capital-output matrix for different kinds of capital and the matrix of capital investment per unit of growth of output, the national economic model usually incorporates capital investments per unit of growth of the physical volume of national income (in constant prices) and capital consumption in national income.

Fixed assets have recently been revalued in the Soviet Union. This makes it possible to construct the capital investment model not only for the country as a whole, but also for individual economic administrative areas. Models for individual economic areas are being constructed, in particular, by the Laboratory of Mathematical Economic Methods of the Academy of Sciences of the USSR.

The mathematical economic methods of processing and analyzing capital investment models and fixed assets are part of what is known as dynamic programming. Although the methods of dynamic programming have not been worked out adequately, their present state, nevertheless, makes it possible to calculate a variant of economic development which, under given conditions and with given restrictions, would ensure the highest possible rate of growth of total national product (or the growth of national income and the consumption fund) at the lowest possible capital expenditures.

The model of socialist expanded reproduction is of special importance for planning the national economy. The inter-branch and inter-area balances of production and distribution are merely particular cases of the expanded reproduction model. The principal feature of the latter is that social production is simultaneously regarded, in strict accordance with Marxist-Leninist political economy, from two aspects: the material aspect (implements and objects of labor, consumer goods) and the value aspect (compensation fund, wage fund and net income of society). This treatment of social production really means that the expanded reproduction model is a three-branch model (implements of labor, objects of labor and consumer goods).

The above principles of constructing the model make it possible to determine directly the expanded reproduction potential as the difference between the net income in the sphere of production of the means of production and the fund of material expenses in the sphere of production of consumer goods. By comparing the potential of expanded reproduction with the actual productive capital investment in fixed and current assets, it is possible to determine how well the basic condition is being fulfilled, the condition of continuous economic development requiring that actual capital investment in fixed and current assets correspond to the expanded reproduction potential as fully as possible.

Research has recently been initiated in our country on improving inter-area production ties. Under this heading are included methodological investigations to construct balances of production and shipments of uniform or interchangeable products and mathematical methods of processing these balances. This field also includes the inter-regional and inter-branch models of the national economy for a particular economic administrative area.

The construction and mathematical treatment of transportation models have become especially widespread of late. Programming methods are used quite successfully in solving these problems. The essence of the problem is to establish, given a certain passage capacity of roads or separate sectors thereof, the most economical transportation plan from a given set of points of departure (having a fixed quantity of given freight) to a set of points of reception (having a specified need for this freight). In this case a study is made of the function describing the total operation of transport (in ton-kilometers of haulage, for example) or the total value of shipments. The transport shipment plan is regarded as an optimum plan if the special-purpose function has the minimum value for given conditions and with given restrictions.

Several methods (algorithms) have been worked out for solving such problems for uniform as well as for interchangeable freight (for coal, wood fuel and peat, for example). More than twenty transport problems have been solved with the computers of the Computer Center of the Academy of Sciences of the USSR in 1960. The problems included the most advantageous pattern of cement shipments on the railroads of the USSR, of peat and building materials in the Byelorussian Republic, of wood fuel in the People's Republic of Hungary, etc. The Institute of Electronic Computers of the Academy of Sciences of the USSR has solved a complex transportation problem involving coal shipments on th railroads of the USSR. The experience of operational planning for the transportation of building materials in Moscow is also extremely interestin Since the stocks of building materials and the nee for them at separate points are constantly changi these operational plans are calculated with electronic computers for each ten-day period. By rationalizing shipments these planned calculations effect a saving of at least four or five per cent in transportation expenses.

Mention should also be made of mathematical economic investigations conducted by the Committee on Labor and Wages in collaboration with the Research Institute of Labor and the Institute of Electronic Computers. The ultimate purpose of these investigations is the construction of a ratio al consumption model. In this field a study is being made of a model of formation of incomes of workers and employees given a fixed distribution of wages. The model is designed to make possib a transition from the distribution of personnel according to wages to a distribution of families according to income per earner.

A study is also being made of diet patterns providing for such combinations of products as woul ensure all elements of nutrition according to scie tifically justified norms at lowest cost. Another field is the study, on the basis of adequate treatment of family budgets, of coefficients of demand elasticity for different consumer goods as incom levels and prices of these goods change. Method of mathematical statistics play a prominent role in these investigations.

The successful application of modern mathema cal methods and electronic computers depends largely on the rational organization of the collection, accumulation, transmission, and processing of the necessary records and planning data. The problems are the concern of so-called economic cybernetics, a new branch of economics on the borderland between economics and cybernetics.

The development of planning and national economic accounting in the USSR has led to vast streams of economic documentation (accounting, reporting, statistical and planning documentation the processing of which is a major function in th control of the national economy. The stream of economic documentation is now split up into different departmental channels (agencies for stati tics, planning, financing, material-technical supp etc.). This documentation often contains identica or similar information, often overlapping, but at

e same time it is not comparable and is frequently
accurate. This state of economic documentation
npedes the automation and mechanization of its
ansmission and processing.

Studies in the field of economic cybernetics makes
possible to determine the volume of information
ocially necessary and sufficient for intelligent eco-
omic control, as well as to considerably increase
e effective use of information. Simultaneously,
is offers the opportunity of reducing the documen-
ry turn-over of the plan through centralized proc-
ssing of relevant economic information. The first
ep in this direction is the elaboration of uniform
andards for technical-industrial-financial plans
d long-range plans coordinated with an integrated
stem of statistical, technical, and clerical re-
orting.

A state with a planned economy has a particularly
cute need for the rational organization of its im-
ense apparatus of standard norms embracing all
ocumentation for technological, designing, planning,
d accounting-statistical standards. Practical
ork along these lines is being conducted by the
omputer Center of the State Economic Council of
e USSR, the Laboratory of Mathematical Econom-
Methods of the Academy of Sciences of the USSR
d a number of other institutions.

A thorough study of the streams of economic in-
rmation and the methods of coding it will, no
oubt, yield a great economic effect within the next
w years. The current system of information is
oviously obsolete. Thousands of employees are
nployed in the endless copying of documents. Be-
des, the transmission of current information
kes too much time and therefore the present sys-
m cannot be used efficiently.

The transfer of planning and accounting informa-
on to a relay transmission system is being studied.
his reform, however, would ensure a quick relay
ansmission of economic accounting data and plan-
ng information only if the latter are transmitted
rectly to electronic computers or information
achines. The Institute of Scientific Information of
e Academy of Sciences of the USSR has begun the
elevant research concerned with the automation of
formation transmission.

Economic cybernetics also involves the study of the inter-action of major economic controls (cost accounting, the monetary and financial systems, material-technical supply, and plan fulfillment controls). Using cybernetics analysis methods, these systems are broken down into functions, to be expressed mathematically in the form of algorithms. The creation of such planning algorithms will raise the accuracy and efficiency of planning documentation to a vast degree.

From the above we can gauge the immensity of the problems facing socialist econometrics and planometrics, and the possibilities opened up for improving planning calculations by using the methods of modern mathematics and electronics. A number of important measures are necessary in the organization of research and the training of personnel to cope with these problems.

A major problem in the organization of research is the improvement of facilities, especially with respect to the construction of service buildings supplied with the necessary computers and information machines. It is also necessary to begin the training of two types of personnel: a) mathematicians and engineers with a sufficient grounding in economics and b) economists sufficiently versed in mathematical techniques. Although much is being done through the channels of universities and other higher schools, the training of economists sufficiently well grounded in mathematical techniques is lagging behind requirements.

To some extent the training is being hindered by the nihilistic position of certain economists who believe that under the conditions of socialism there are no grounds for creating, in the intermediary field of knowledge (between economics and mathematics), a special applied and academic discipline concerned with the problems of Soviet econometrics and planometrics.

The development of these fields, however, and the training of the necessary specialists would make it possible to acccelerate the application of modern mathematical techniques as well as electronic computers and information machinery in economic research and planning, to essentially improve the current system of planning calculations, and to automate the collection, transmission, and processing of planning and accounting information.

Planovoe Khoziaistvo, 1961, No.

A. Strukov

SOME QUESTIONS OF THE FURTHER IMPROVEMENT OF NATIONAL ECONOMIC PLANNING

Planning of the national economy is a most important instrument in building a communist society. That is why the Party and the government have always devoted a great deal of attention to the organization and improvement of methods of national economic planning.

A wealth of experience in the planned management of the economy has been accumulated in our country during the years of Soviet power. Together with the consolidation and development of the forms and methods of managing the national economy, with the emergence of new economic and political tasks the system of planning has been changed and improved. Particularly great successes in the improvement of planning have been registered in recent years. In connection with the reorganization of industrial and construction management the role of the union republics and local planning agencies in planning has been raised considerably. Agencies capable of planning the entire economy of republics and areas have been developed and consolidated in the union republics. The tasks and functions of planning agencies have been changed substantially. A new procedure of drawing up plans has been instituted. Today the center of gravity in planning has been shifted to the localities, to the economic councils, industrial enterprises and construction sites. Thereby, excessive centralization in national economic planning has been eliminated and the necessary conditions created for the proper combination of planning by branches and areas.

The application of Lenin's ideas concerning the proper combination of current and long-term planning is of great importance in the improvement of planning. The socialist economy needs plans designed both for extended periods, for a number of years, and for shorter periods.

While stressing the importance and need for long-term plans, the Party and government have always devoted a great deal of attention to current plans drawn up for short periods. Long-term national economic plans are realized through current plans which, in turn, are based on the assignments of the long-term plans. Current plans make it possible to specify concretely the assignments of the long-term plans and facilitate the bringing of these assignments to the enterprises, construction sites, etc., which are to carry them out; to increase the precision and correct the assignments of the long-term plans in accordance with the new tasks of developing the socialist economy; to ensure not only the fulfillment but also the overfulfillment of long-term plans by taking into account the resources created in the course of fulfilling the plan, by mobilizing the creative energies and initiative of the masses and applying the best experience.

Raising the level of long-term economic plannin requires the scientific generalization of the exper ence of economic construction and the study of new problems posed by life, as well as a profound study of the laws governing the gradual transition from socialism to communism.

At the same time, as the specialization and coordination of production develop, the growing and deepening ties between economic areas require improved work in current planning, the elaboratio of material supply plans, the reciprocal coordination of plans for the development of economic areas, and stricter control of plan fulfillment.

In conformity with these tasks, the functions of long-term and current planning have now been separated organizationally. The State Economic Council of the USSR is concentrating attention on long-term planning, and the State Planning Comm tee of the USSR — on the elaboration of problems of current national economic planning, the coordination of the activity of the union republics in economic development, and the solution of day-to-day questions which arise in the process of plan fulfil ment.

The decision of the government on ensuring continuity in national economic planning is of great importance for the improvement of planning. The Council of Ministers of the USSR has decided that in drawing up current plans, planning agencies should work out simultaneously the principal targets of economic development for the last year of the current five-year period so as to have a continuously operating five-year plan. For example, in drawing up the plan for 1962 the basic targets the plan for 1966 will be elaborated.

As we know, the construction of many enterprises is begun every year in our country. The design and building of large enterprises of the

tallurgical, chemical and heavy machine-building
ustries, the design and manufacture of large
am and hydraulic turbines, boilers, sea-going
ps, etc., the training of specialists of high and
erage skill — all this requires a long time, four,
e, or more years. In view of this, in drawing up
rrent national economic plans, particularly for
pital construction, designing and survey work,
l for a number of branches of heavy machine-
lding, it is necessary to determine the develop-
nt of these and allied branches for the next seve-
years.

The elaboration of constantly operating five-year
ns will be of great importance for ensuring
per proportions in the development of the vari-
branches and regions of the economy, in the ra-
nal location of the productive forces and the
lest possible reflection of the achievements of
ence and technology in the plan. Such a planning
cedure will make it possible to reveal more fully
l to utilize internal production reserves for the
fillment of the magnificent program of commu-
t construction in our country.

mportant measures have been taken recently as
gards the technical and economic substantiation
the plan. For the purpose of promoting the fuller
plication of the achievements of technology in the
velopment of the national economy, improved tech-
al substantiation of production plans and the or-
nic coordination of assignments for the develop-
nt and introduction of new technology with other
tions of plans, it has been established that the
fting of production plans at enterprises, construc-
n sites, in the economic councils, ministries and
partments of the USSR should be preceded by the
boration of measures for the development and
roduction of new technology in the national econ-
y. A list of new, improved machinery and equip-
nt designated for introduction should be drawn up
advance, as well as a list of technically obsolete
chinery and equipment, the production of which
uld be discontinued in the planned year.

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The further improvement of planning methods
st be based on the requirements of the economic
s of socialism, above all the basic economic law
socialism and the law of balanced, proportional
elopment of the national economy, which under
ialism are objective necessities determined by
predominance of socialist ownership of the
ans of production.

The development of the economy requires a cer-
proportionality, a conformity in the develop-
nt of individual branches and spheres of repro-
tion. However, "under capitalist production the
portionality of the individual branches of
production," as Marx pointed out, "springs as a continual process from disproportionality, because the cohesion of the aggregate production imposes itself as a blind law upon the agents of production." (1)

Whereas in capitalist society proportionality is established spontaneously, at the price of huge destruction of the productive forces, in socialist society proportionality is constantly and consciously maintained by society. V. I. Lenin pointed out that "constant, deliberately maintained proportionality would, indeed, signify the existence of planning." (2)

The balance method, used in planning since the first years of Soviet power, is an important means of ensuring the necessary proportionality in our plans. Specifically, when drawing up the state GOELRO plan, the basic elements of the principal material balances — fuel, electric power, some types of equipment and building materials — were calculated. Subsequently the balance method was increasingly applied and became the principal method used in planning the national economy.

The balance method is used in drawing up a system of material, labor and financial balances, as well as a balance of the national economy as a whole. These balances help to reveal the requirements of the national economy for different types of goods and to determine the sources for meeting these requirements. The balance method makes it possible to reveal the bottlenecks which arise in particular sectors and to establish in the plans the necessary proportions in developing the various branches of the economy.

The drawing up of all balances, particularly material balances, is based on norms of expenditure of material resources, which should rest on technical and economic calculations that take account of the achievements of advanced science and technology and the experience of production innovators. But the share of experimental-statistical norms in planning is still very high.

In considering the situation prevailing in the setting of norms of expenditure of materials, the Plenary Meeting of the Party Central Committee in July 1960 instructed the State Planning Committee of the USSR, with the participation of the Councils of Ministers of the union republics, ministries and departments, to work out measures for a radical improvement in the setting of norms of expenditure of material resources, as well as norms of circulating capital and stocks of goods and material values for all levels of the national economy. The interest of enterprises in working out progressive expenditure norms and in using material resources more rationally must be heightened.

In improving national economic planning an important part should be played by the balance of inter-branch ties. The material balances now being drawn up are hardly connected with the balance of the entire social product. Yet the national economy represents an aggregate of various branches which are closely interconnected. Moreover, as science and technology develop and the scale of production and technical progress grow, and as the social division of labor is further deepened, new branches are constantly arising and national economic ties are developing continuously. This requires an improvement in methods of measuring national economic ties and reflecting them in the plan. Therefore it is very important to accelerate the elaboration of a balance of inter-branch ties in value and physical terms, which will make it possible to dovetail the balance of the social product with the individual material balances.

At present the Central Statistical Administration of the USSR is completing the elaboration of a balance of inter-branch ties on the basis of data for 1959. Recommendations on the use of the balance of inter-branch ties in national economic planning should be drawn up as a result of a comprehensive study of this material.

The further improvement of national economic planning is inconceivable without increasing the role of the balance of the national economy in drafting the plan. The balance of the national economy provides a generalized description of the process of expanded socialist reproduction, the principal connections and proportions of the national economy — the relations between department I and II of social production, between the development of industry and agriculture, consumption and accumulation, etc. A preliminary elaboration of the principal indices of the balance of the national economy will help to determine correctly the scale, rates and proportions in the development of the socialist economy, the resources for capital investments, for raising the living standard of the population, for the growth of accumulation, etc. That is why the drawing up of long-term and current plans should begin with the elaboration of the principal indices of the balance of the national economy.

Balances of the national economy for the planned and reviewed periods are now drawn up only for the USSR as a whole. Yet in view of the reorganization of economic management and the enhancement of the role of the union republics in planning, real possibilities have been created for the working out of balances of the national economy in the union republics as well. The first steps in this direction have already been taken in the union republics. The volume of output of the social product and the national income, as well as the real incomes of the popula tion are being calculated. As a result of the calc lation of these indices alone, each union republic is able to analyze for its own territory the rate o growth of the entire social product, the branch and social structure of the economy, and the rela tions between separate categories of production within each branch. In calculating the national income the effectiveness of production is disclosed

The elaboration of a balance of national income for each union republic is an important task. Of course there are certain difficulties in this matte since the financial balance, which is the initial m terial for working out the balance of national income, is still not being drawn up for the union republics. Nor is a balance of the money income and expenditures of the population by social grou being drawn up. The task now is to hasten the elaboration of methods for drawing up the financi balance of the union republics and the balance of the money incomes and expenditures for social groups of the population.

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An improvement in the system of plan indices i of great importance in perfecting national econom planning.

The present system of plan indices provides a characterization of all the major aspects of expanded socialist reproduction — production, distribution, exchange, consumption and accumulati It is patterned in conformity with the territorial principles of the organization of economic manag ment and takes account of the respective subordi nation of enterprises and separate links of the na tional economy, as well as the territorial divisio of the Soviet Union into republics, territories, regions and economic areas.

But while it gives on the whole a proper chara terization of the development of the national eco omy, the existing system of indices in a number cases does not provide sufficient stimuli for ente prises to use fixed and circulating assets more efficiently, to improve quality and assortment, t reduce production costs, etc.

Serious shortcomings in the existing system o state plan indices have been repeatedly noted recently in our press, including *Planovoe Khoziais* This applies in the first place to value indices (gross and marketable output of industry, the index of outlays per ruble of marketable output, etc.). At the same time certain other indices, those characterizing the volume of production in physical terms, have also been criticized.

The index of gross output of industry, calculat according to the factory method, holds a special place in the system of value indices. Gross outp a summary index is used to characterize the dy- mics of industrial production and plan fulfillment, determine the volume of the social product and national income of the USSR, the level of labor oductivity, the relation between the output of eans of production and consumer goods, between lustry and agriculture.

The many years of experience of using the gross tput index have demonstrated the reliability of ny calculations performed on its basis. But this lex has important shortcomings in characterizing activity of separate enterprises. That is why assessing the activity of enterprises it was ind expedient to work out additional indices which ıld characterize more precisely the volume of rk done at each enterprise. As a rule, the value material outlays, that is, the value created by la- r at other enterprises, should not be included in ese indices. This can be done either by directly ducting the value of material outlays from the en- e output or by calculating output in prices (stand- ds) which exclude the value of material outlays.

Different variants of such indices can be used in rticular industries. In addition, for the appraisal the activities of enterprises in some branches it possible to use indices of gross and marketable tput, as well as an index of the volume of produc- n expressed in terms of norms of labor expendi- re. Other variants of improving the assessment the operation of enterprises are also possible. me of these proposals have already been intro- ced in planning. Thus, in a number of industries index of the standard value of processing is used; some branches of the light and food industries xtiles, fur and leather, meat, vegetable oil, gar) the planning and accounting of output is based on the factory method, but the method of gross nover.

A study of different indices at 500 enterprises in umber of industries has been undertaken with the ect of working out recommendations on the possi- ity and expediency of utilizing one or another in- for assessing the operations of industrial enter- ses. The processing and summary of this terial is now being completed, after which cor- sponding recommendations will be made. But even v, in the basic methodological regulations for awing up the state economic development plan, erprises are advised, in agreement with econom- councils, to work out and introduce one or anoth- additional target if it correctly reflects the ume of production in the given branch.

Methods of calculating the gross output of agricul- e also require further improvement. Although index of gross agricultural output is not ap- oved in the plan, it plays a very important part in calculating the total volume of the social product and the national income, the money and real incomes of the farm population, the proportions in the development of industry and agriculture, etc.

But the methods of calculating this index in current prices are extremely cumbersome and laborious. Thus, according to the methods now in use marketable output is estimated at the prices at which it is realized, and this is absolutely correct. But when the non-marketable output, that is, the output remaining in the economic unit, is evaluated partly at the cost of production (and the methods used to calculate this are still the subject of discussion) and partly at average realization prices, this reduces the economic reliability of the gross output index. In our opinion the non-marketable output of the collective farms and of the population should be estimated according to uniform state purchase prices, which would greatly simplify the calculation. As for determining the actual share of agriculture in the production of the social product and the national income, this requires special calculations in terms of value.

Production cost indices are of great importance for assessing the qualitative indices of performance of enterprises. At present the index of outlays per ruble of marketable output is used to characterize changes in production outlays. In some branches of industry where the output is homogeneous the index of production costs per unit of output (coal, oil, gas) is used.

The index of outlays per ruble of marketable output, reflecting more or less correctly the change in outlays for industry as a whole, has important shortcomings in assessing the activities of individual enterprises. A change in the prices of goods, as well as in the quality and assortment of processed raw materials produces a situation in which enterprises, even if they work well, do not fulfill the established plan for a reduction of production costs and in some cases are beset by financial difficulties. The attempt to find one universal index of outlays should probably be abandoned. In our opinion, a system of indices adapted to the nature of the various branches of industry should be worked out. Where the output is homogeneous, indices of production cost per unit of output should be used. In other branches, where the share of comparable output is high, an index of the reduction of production cost for comparable marketable output should be applied; in branches with a wide and rapidly changing assortment, an index of outlays per ruble of marketable output should be utilized, and so on.

The existing system of plan indices does not reflect in full measure the use of fixed assets both in the national economy as a whole and in separate enterprises and branches. Yet the most efficient use of fixed assets promotes a rise in labor productivity, a reduction of production costs and a growth of output. There are only a few indices of the utilization of particular types of equipment, but even they do not take into account the sum total of fixed assets (according to data of the revaluation of fixed assets, equipment comprises only 20% of fixed assets). Yet an improvement in the utilization of fixed assets makes possible an increase in output without additional capital investments and is an important factor in accelerating the rates of socialist expanded reproduction.

The experience of recent years shows that although the assignments for commissioning productive capacity in a number of branches is not fulfilled, the production plan is overfulfilled. It follows from this that the assignments for the growth of production in a number of cases are fulfilled with smaller capital investments than assigned under the plan. At the same time this also shows that a number of organizations and departments are making unjustified applications for capital investments.

By a decision of the Council of Ministers of the USSR the fixed assets of state and cooperative enterprises (except collective farms) were revalued as of January 1, 1960, and the extent of depreciation of these assets was determined. All fixed assets subject to depreciation, including non-productive assets and housing facilities, were revalued. The revaluation removes one of the main obstacles to establishing value indices of the effectiveness of fixed asset utilization.

Various proposals for establishing indices of the utilization of fixed assets are now being made. Specifically, it is being suggested that profitability be planned in relation to the fixed and circulating assets invested in production and not to the costs of production. It is assumed that such a procedure of planned profitability will stimulate greater savings of fixed and circulating assets.

The proposal to use an index of output per ruble of fixed assets merits attention. Such an index should be regarded as most acceptable, although it too, is not without shortcomings. The point is that the volume of output in money terms depends on the organizational structure of an enterprise to a certain extent. That is why in comparing approximately similar enterprises, but with a different organizational structure, the indices of the utilization of fixed assets in relation to the value of marketable output will be different. The influence of the organizational structure of enterprises can be partly eliminated by calculating gross output per ruble of fixed assets, inasmuch as gross output takes fuller account of the volume of work of an enterprise th
does marketable output.

The index of output per ruble of fixed assets ca
be subject to marked fluctuations depending on la
bor expenditures, material expenditures and prof
tability of output. Material expenditures and
profitability are not the same in various branche
Hence to ensure comparability it is advisable to
establish the index of utilization of fixed assets
separately for individual categories of productio
and branches. For branches producing homogene
ous output (electric power, coal, crude oil, gas,
timber felling, etc.), instead of a value index an
index of output in physical terms per ruble of fix
assets may be established.

The effectiveness of utilization of fixed assets
depends largely on their structure, and specifica
on the share of the active part of fixed assets —
instruments of labor (machines, instruments,
transmitting devices, etc.). That is why in analyzing the utilization of fixed assets we must con
sider their structure.

Together with value indices, the system of indices in kind should be improved.

Indices which do not stimulate enterprises to
utilize raw and other materials economically are
still used in planning. Among them, for example
are the plan indices for some types of heavy machinery, rolled metal and light industry goods
expressed in terms of weight.

To save metal and stimulate the initiative of i
dustrial personnel in reducing the weight of outp
such goods as metallurgical equipment, metal se
tions, etc., should be planned not in terms of weig
but in number of pieces. In this connection it
would be necessary to improve the work of maki
standards and norms more precise, as well as
unifying technological processes. The existing s
tem of planning output should be changed in light
industry as well, where the planning of productio
for example, of sole rubber and hard leather goo
should be conducted not in terms of weight (in
tons), but in units of area — square meters.

The approach to determining the effectiveness
utilization of various raw materials and fuel is
sided to some extent. Thus, for example, in wor
ing out the problem of developing the production
coal, oil and gas, these products are considered
primarily as sources of power. From this stan
point the advantages of oil and gas are indisputa
But each of these products also represents a va
ble raw material for the chemical industry. Th
is why in determining the effectiveness of utiliza
tion of various raw materials and fuel, we must
take account of all their properties. In calculat
the effectiveness of utilization of various raw

aterials and fuel in the plan, consideration should given to working out an index such as the value the end product obtained from a unit of material. r example, what output in money terms is to be rived from a ton of rolled metal, coal, oil, etc.?

The constant improvement of national economic anning is of great importance for accomplishing e tasks of communist construction in our country. creative discussion of these questions in planning encies and research organizations makes it possible to work out proper recommendations for the further improvement of the system of indices of the national economic plan.

Footnotes

(1) Karl Marx, Capital, Vol. III, 1951, p. 267 (Russian edition).

(2) V. I. Lenin, Sochineniia, Vol. 3, p. 545.

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Tokarev and P. Alampiev

OBLEMS IN IMPROVING THE TERRITORIAL ORGANIZATION OF THE ONOMY AND ECONOMIC REGIONALIZATION

The 21st Party Congress noted in its resolutions importance of a proper territorial organization the national economy. This problem comes to the efront in the period of the comprehensive building communism because the immense growth of the lume of production and the complexity of the economic relations between areas and within them can d to considerable losses if territorial planning of national economy is not given proper attention.

"The unparalleled scale of construction in the t seven years," Comrade Khrushchev said at the st Party Congress, "requires that we give special ention to the distribution of the productive ces."

t has become especially important today to plan national economy by large economic areas as main territorial segments of the USSR national onomy.

Planning the development of the productive forces our country by large economic areas has a long tory. It began in 1920 with the working out of the st long-range plan of national economic development — the GOELRO Plan. It demonstrated the ed, from both the state and economic viewpoint, dividing the country into economic areas and it defined the concrete tasks of their specialization.

In all later stages of socialist construction economic regionalization was an integral part of state planning and helped in the working out of the economic development plans of the Soviet Union on a scientific basis.

Lenin's instructions for compiling the GOELRO Plan and the plan itself combined branch and area divisions. Lenin believed that one of the main achievements of the GOELRO Plan was the working out of concrete programs for the economic rebirth of the country's principal areas, in which area electric power stations were to provide the basis for the creation of power-consuming area complexes.

The overall plan of development of each economic area, linked together in a single economic plan, defined the pattern of the rational division of labor and cooperation among areas, with account taken of their natural resources and possibilities, and helped to develop the country's productive forces. Lenin said that now the workers and peasants of each area could see how formidable their task was and how it had to be tackled.

The compilation of an overall plan for each large area and the coordination of the area plans so as to fashion a single economic plan for the country made it possible to outline and determine the pattern of rational division of social labor among areas, taking into account their natural and other

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productive resources, and also the historically-developed production skills of the population.

A comprehensive plan on a territorial basis was also compiled in the First Five-Year Plan. Concrete problems of economic construction in each economic area were elaborated in the plan. Socialist industrialization of the country and the bringing of industry close to the sources of raw material and fuel, elimination of the essential differences between town and countryside and of the economic backwardness of the non-Russian areas required a radical correction of the irrational distribution of the productive forces in our country.

The Second Five-Year Plan of economic development was compiled for individual republics, territories and regions. The specialization of each area was determined in accordance with its climate and soil, natural resources and level of productive forces. The plan's breakdown by areas was embodied in a number of summary tables and groups of tables for the individual economic administrative areas — regions, territories and republics. The indices characterized the territorial plan for the major branches of the national economy, determined progress in the distribution of new construction and production of individual branches by economic areas. The basic tasks of economic development were determined and formulated for each economic area and a composite characterization was given of the area's economic development.

The Third Five-Year Plan was compiled for the nine principal economic areas of the RSFSR and the ten union republics.

When in connection with the implementation of the broad program of socialist industrialization the need arose for setting up new branches of industry in a short time, new organizational forms were required for administering economic development.

People's commissariats, and later ministries, were formed for the more important branches of the national economy.

These forms of economic direction made it possible to concentrate efforts on establishing branches of heavy industry and training highly-qualified engineers, technicians and industrial organizers capable of mastering the new techniques and carrying on industrial production on an extensive scale.

In conformity with these forms of managing the economy, planning was based on plans drawn up by the ministries and departments. At the same time a plan was also worked out on a territorial basis. However territorial planning was not given proper attention.

Territorial planning lagged behind planning by branches for a long time. Branch planning was practiced by numerous ministries, but area planning was done chiefly by small sub-divisions of the USSR State Planning Commission, which did not a ways cope with the complicated problems of brea ing the plan down by areas.

In addition, a big shortcoming in territorial pla ning was that it had a passive nature: very often the branch ministries' production and constructio targets were mechanically inserted in the area plans without adequately taking into account the general economic principles for distributing production. Territorial planning lagged behind also with respect to time: first the branch plan was compiled and later the area plan was added to it. is of interest to note that the GOELRO Plan was worked out simultaneously for branches and area

For almost 20 years the division of the USSR into 13 large or main economic areas was used i drawing up the national economic plan. These areas were the North, North-West, Central, the Volga Area, North Caucasus, the Urals, Western Siberia, Eastern Siberia, the Far East, Central Asia and Kazakhstan, Transcaucasis, the South, a West.

This regionalization rendered considerable hel in planning the distribution of production. However one of its big shorgcomings was that it had organizational means to provide on the spot coor nation of economic activity for the large economi areas.

Under centralized, departmental administratio of the national economy such a situation was normal. However the shift to the new system of administering industry and construction required th establishment in the localities of such bodies as could consider the major problems of developme of the large areas.

The reorganization of the administration of industry and construction on the territorial princip in 1957 created substantial possibilities for improving the territorial organization of productio Extension of the rights of the union republics an local government bodies in administering the ec omy and the establishment of economic councils the economic administrative areas considerably improved the administration of the economy and current and long-range planning. And this, in tu made for successful fulfillment of the national e nomic plans and for raising the standard of livin of the Soviet people. The further development o the Leninist principle of democratic centralism led to an increase in the activity of the working ple, in their creative participation in directing t national economy.

However it is impossible to solve many proble of correct territorial organization of the nationa economy within the limits of an economic

ministrative areas. A territorial division of la-
r which embraces the whole country requires the
velopment and regulation of economic ties not only
thin the economic administrative areas, but also
thin larger territorial sub-divisions of the nation-
economy, namely, large economic (economic-
ographic) areas.

The 21st Party Congress emphasized that marking
t large economic-geographic areas for planning
rposes facilitates proper geographical distribution
d the most economical territorial organization of
e national economy of the Soviet Union.

A large economic area is made up of a group of
ntiguous economic administrative areas which,
the course of economic development, have become
definite economic community. Compactly situated
territory and jointly working to carry out various
portant national tasks in the national division of
bor, these groups of economic administrative
eas need systematic coordination of their planning
d economic activity.

As a result of technical progress, the concentra-
n of production has reached such a level that
any production projects, such as large electric
wer stations, metallurgical works, complexes of
emical enterprises, modern oil refineries, and
oups of machine-building enterprises, require for
eir construction the joint efforts of a number of
onomic administrative areas. The impact of
ese enterprises extends far beyond their adminis-
ative area. Their ties for coordination of produc-
n generally encompass a group of administrative
eas.

The economic ties within large economic areas
e therefore very strong and tend to grow still
ronger. Improvement of the system of current
d long-range planning by large economic areas is
gently necessary for their balanced development.

Overall plans of economic development of the
rge economic areas are an integral part of the na-
nal economic plan. Taking into account the cardi-
l importance to the state of proper planning of
ecialization and overall development of large areas,
e Plenum of the Party Central Committee which
et in July of 1960 instructed the USSR State Eco-
mic Council to make a study, jointly with the re-
blics, of production ties by branches of industry
d areas and to determine which of them are most
ective, and to work out production specialization
the economic areas, rational forms of specializa-
n and coordination of industry within the econom-
areas on the basis of division of labor for the
ntry as a whole, so as to use them later as a
sis for planning national economic development.

Rational and inter-connected distribution of the
oductive forces by economic areas on the basis of new techniques results in a considerable increase in the productivity of social labor. Correct planning of specialization and overall economic development of the areas presupposes first of all that the interests of the country as a whole are secured.

Two main groups of production branches can be distinguished in the economies of the economic areas.

The first group comprises the leading, key branches in which the area specializes. The output of these branches has inter-area or national importance. This group of branches, which determines the area's specialization, is at the same time the basis for fashioning the whole economic complex of the economic area. The area's specialization ensures the production of individual items for the national economy at a minimum cost to the latter. The chief economic criteria for indicating the effectiveness of the areas' specialization are lower production costs and shorter recoupment for capital outlays.

The second group of branches in the area is called upon to serve the requirements of the first and to supply the needs of the area's population, making overall use of the local raw material, fuel and other resources insofar as it is expedient to do so.

Specialization has a big impact on the economic complex of a particular area, its economic pattern. It is determined in the final analysis in the interests of a proper territorial division of labor in the country, which helps to accelerate the rates of expanded socialist reproduction.

It is of decisive importance in assessing the conditions for developing economic specialization of the areas to compare the economic effectiveness of output products in the different areas of the country and to determine the effect of the output of these products in a particular area on the growth of productivity and the saving of social labor. To illustrate, the high economic effectiveness of coal mining and hydro-electric power production in Siberia and the availability there of very large deposits of non-ferrous metal and other natural resources are necessary conditions for establishing the main center of heat- and electricity-consuming industries in these areas.

To draw up a plan on an area basis is a highly complicated matter. To do so it is necessary not only to formulate the fundamental questions of specialization of an area with a complex economy, but also to fix concrete targets and prepare recommendations for a whole system of indices of the territorial plan which would make it possible to determine the effectiveness of the economic development of the given economic area.

By way of illustration we shall cite some indices of a plan on an area basis which, in our view, make it possible to determine the effectiveness of the contemplated economic development of the area. These indices should include not only the absolute size of production, in value and physical terms, and capital investments, determined primarily on the basis of balance sheets of production and consumption, but also qualitative indices; it is necessary to know the production cost of the products to the producer and the consumer (taking into account the cost of transportation). To determine what a particular area contributes to the national economy, an analysis has to be made of the national income and social product produced in the particular area.

It is also necessary to have an estimate of the natural resources from a technical-economic angle, indices of the use of mineral and other raw material resources, forests, agricultural and other land, indices of employment, output per head of population, the ratio between the main and supplying industries for gross output and manpower, indices of consumption by industry and agriculture of their own products and its proportion to total consumption.

It is necessary to compare output with the number of workers employed and the number of able-bodied persons, the extent to which the minerals in the area have been brought under exploitation, the coefficient of the use of production capacities to the output of major types of production, the index of overall processing of raw materials, and a number of other indices, bearing in mind that economic development of the areas requires harmonious integration of the different branches of production.

Notwithstanding considerable successes in planning the distribution of productive forces in the USSR, which made it possible to create a new geography of the national economy, considerable shortcomings have been observed in planning practice. Primarily they involve giving inadequate attention to the economics of selecting areas and sites for building new enterprises and reconstructing functioning ones, and to their specialization and coordination. This has led ultimately to unprofitable operation of many enterprises and higher costs of production from the standpoint of the national economy.

The shortcomings in locating enterprises were due mainly to the following:

the backwardness of economic science in the theory of socialist distribution of production;

a desire on the part of the heads of economic and designing organizations to give preference to populated and developed areas of the European part of the USSR in locating enterprises, and an underrating of the economic need for exploiting the natural resources of new eastern areas;

elements of parochialism and of a narrow dep mental approach in locating enterprises, and a lessening of the proper care in basing the selec tion of areas and sites for constructing enterpri on comprehensive technical and economic considerations;

disconnection of enterprises due to departmen ization, which hindered proper specialization an overall economic development of the areas;

the insufficient account taken of the specific n ture of the local natural, economic and historica conditions of the areas.

The practice of planning by economic areas which has evolved does not yet conform in many ways to Lenin's instructions. In speaking of the help to be given by the localities to the central agency, he demanded "a model organization of a small 'whole,' but precisely a 'whole,' that is, n a single economy, not a single branch of econom not a single enterprise, but the *sum of all* economic relations, the *sum of the whole* economic turnover, even if it is only of a small locality."*

The area principle of organizing the productiv forces means that in locating an enterprise anywhere in the country (or in determining the specialization of a functioning enterprise), the ente prise should occuyy that place in the system of t area economy which will result in the highest economy of social labor and the most rational d vision of labor among the areas. What is neces sary is the most complete overall use of the natural resources and conditions, labor resourc and the previously created material values on th basis of the latest achievements of science and technology.

In the recent past the problem of rational distribution of the productive forces consisted mai in substantiating the selection of a site for individual enterprises of particular branches of the economy. Attention was given chiefly to the spe cific features of distribution of individual branc over the country as a whole. In the present sta of national economic development, especially in the light of the impending tasks for completing creation of the material and technical base of co munism, the problem of distributing the produc forces has grown into the problem of the develo ment, distribution, rational structure and relati of territorial industrial complexes of various types and scale, from large areas to individual dustrial centers. In general perspective the pr lem of the rational distribution of the productiv forces will increasingly grow into a problem of the rational territorial organization of the

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* V. I. Lenin, *Soch.*, Vol. 32, p. 334.

untry's productive forces as a whole. To meet
is problem it will be necessary to improve plan-
ng by large economic areas — the basic units of
e territorial structure of the national economy of
e USSR.

The organizational forms have already been found
r putting the planning of economic development of
rge areas on a sound basis. On April 26, 1961 the
rty Central Committee and the USSR Council of
inisters adopted a decision providing for the es-
blishment of coordination and planning councils in
rge economic areas for a better solution of na-
nal economic problems which extend beyond the
nits of individual economic administrative areas.

It is the function of these councils to study and
amine the major problems of overall development
the national economy in the large economic areas.
the basis of these studies recommendations and
oposals are to be worked out for the most expedi-
t use of the productive capital, and natural and la-
r resources of the given area for the purpose of
veloping industry and transport in the area and in
e national economy as a whole.

The recommendations and proposals of the coun-
ls are to be submitted to the respective council of
inisters of the union republics and also to the State
onomic Council and State Planning Commission of
e USSR so that these proposals can be taken into
count in directing the national economy and in
awing up current and long-range plans.

The coordination and planning councils are made
of leaders of Party, government and economic
dies in the localities, including the first secre-
ries of the Party central committees of the union
publics and of the territorial and regional commit-
es of the Party, the chairmen of the council of
inisters of the union and autonomous republics and
the territorial and regional executive committees,
e chairmen of the republic planning commissions
d of the regional (territorial) planning commis-
ons, and the chairmen of the economic councils.
e councils will also include prominent scientists
d technical experts, including the presidents of
e academies of sciences of the union republics and
tstanding specialists of enterprises, research, de-
gn and other organizations in the area.

With such an authoritative composition, the coun-
ls' decisions will be fully qualified and effective.
llective consideration of problems of economic
velopment affecting a number of economic adminis-
ative areas which are part of a larger area, prob-
ms in which these areas have an interest, will
ake it possible to choose the best solutions, taking
o account both local and national interests. The
ligatory participation of representatives of the
ate Economic Council and the State Planning
Commission of the USSR in the work of the councils will help in this.

The tasks given to the new territorial coordination bodies required certain changes in the network of economic areas. Besides, the division of the USSR into large areas made in the Third Five-Year Plan has become outdated in the past two decades.

In 1960 the State Planning Commission of the USSR, taking the existing network of 13 areas as a basis for regionalization, made certain changes and increased the number of areas to 16. The establishment of the coordination and planning councils has required further changes to correspond to the new organizational forms of territorial planning.

Today the country is divided into 17 large economic areas, plus the Byelorussian and Moldavian economic administrative areas, which have not be been included in the larger economic areas.

Compared with the network which existed up to 1960, the most important changes have been made in the Central, Southern, Kazakhstan, Central Asian and North-Western Areas. The excessively large economic areas have been divided in accordance with the specific nature of their economies, the specific features of specialization of production and overall development. In the North-West, on the contrary, two areas (the Northern and North-Western) have been amalgamated.

Two tendencies in the development of the economic areas are clearly reflected in these changes. The first tendency is differentiation of areas in the course of their development and the growth of their economic potential. The second tendency is consolidation of areas as a result of the expansion of their economic ties and greater economic gravitation towards large industrial centers.

The North-Western Area now encompasses the entire northern zone of the European part of the USSR, which gravitates towards Leningrad, the main industrial center. It is comprised of the Arkhangelsk, Vologda and Kaliningrad Regions, the city of Leningrad, the Leningrad, Murmansk, Novgorod and Pskov Regions, and the Karelian and Komi Autonomous Republics. Situated in this area are Leningrad's metallurgical and fuel base — the Cherepovets Metallurgical Works and the Pechora Basin. A vast forest belt stretches across the entire area — the chief center of the timber industry of the European part of the USSR.

The Central, Volga-Viatka and Central-Black Earth Areas were formerly part of the one Central Area. However the differences in specialization and basic national economic tasks, and the excessively large size of the area in terms of population and production made it necessary to divide it into three parts. The Central Area now includes the city of Moscow and the Moscow Region, and the regions which gravitate directly towards Moscow — Briansk, Vladimir, Ivanovo, Kalinin, Kaluga, Kostroma, Riazan, Smolensk, Tula and Yaroslavl. They form a ring around the Moscow Region. Included in the Volga-Viatka Area are the Gorky Region, which includes the city of Gorky, one of the largest industrial centers of the USSR, and the adjacent Kirov Region, Mari, Mordvinian and Chuvash Autonomous Republics. The Central-Black Earth Area, which embraces the Belgorod, Voronezh, Kursk, Lipetsk, Orel and Tambov Regions, besides specializing in its traditional branches — agriculture and the food industry — will continue to exploit the iron ore deposits of the Kursk magnetic anomaly and develop a new metallurgical center.

The Volga Area, which embraces the Middle and Lower Volga, includes the Astrakhan, Kuibyshev, Saratov, Stalingrad and Ulianovsk Regions, the Tatar ASSR and, in addition, the Penza Region, which is closely linked to the Volga Area economically.

The North-Caucasus Area underwent no change as compared with the previous networks of large areas. It contains the Krasnodar and Stavropol Territories, the Rostov Region, and the Daghestan, Kabardino-Balkarian, Kalmyk, North-Ossetian and Checheno-Ingush Autonomous Republics.

The Ural Area, the country's second metallurgical center, the region of non-ferrous metallurgy, the chemical and heavy machine-building industries, includes the Orenburg, Perm, Sverdlovsk and Cheliabinsk Regions, and the Bashkir and Udmurtian Autonomous Republics, all of which comprised the Ural Area under the old network, and the Kurgan and Tiumen Regions, which gravitate toward the Ural. The Kurgan Region's agriculture and machine-building industry and the Tiumen Region's timber industry and rising oil and gas industry are closely linked with the Ural national economic complex.

The Western-Siberian Area has been considerably reduced in territory in the new regionalization, as the Tiumen and Kurgan Regions went into the Ural Area. The Altai Territory and the Kemerovo, Novosibirsk, Omsk and Tomsk Regions remain.

The Eastern-Siberian Area (Krasnoiarsk Territory, Irkutsk and Chita Regions, the Buriat, Yakut and Tuva Autonomous Republics) and the Far-Eastern Area (Maritime and Khabarovsk Territories and the Amur, Kamchatka, Magadan and Sakhalin Regions) remain within their previous bondaries.

The old Southern Area has been divided into three areas: the Donets-Dnieper, South-Western and Southern Areas, with the Moldavian SSR remaining outside the large economic areas.

The Donets-Dnieper Area, which includes the Dniepropetrovsk, Zaporozhye, Lugansk, Poltava, Stalino, Sumy and Kharkov Regions, is notable as the chief coal and metallurgical center of the USSR The area has a highly developed heavy industry an its urban population is twice the size of its rural population.

The South-Western Area includes the Vinnitsa, Volynia, Zhitomir and Trans-Carpathian Regions, the city of Kiev, and the Kiev, Kirovograd, Lvov, Rovno, Stanislav, Ternopol, Khmelnitskii, Cherkassii, Chernigov and Chernovtsii Regions. It is the largest Ukrainian area for population (more tha 20,000,000 people). It differs considerably from th Donets-Dnieper Area with respect to production patterns. Seventy-two per cent of the population o this area live in rural localities; agriculture, suga and other branches of the food industry play an important part in the area. Of the branches of heavy industry, the machine-building industry is the mos developed. The Southern Area (the Crimean, Nikolaev, Odessa and Kherson Regions and the city of Sevastopol), the smallest of the Ukrainian areas in terms of size of territory and population, is situated on the Black Sea. The cultivation of fruit, win and vegetables, the canning industry, and health-resort facilities are extensively developed in this area. With respect to the branches of heavy industry, machine-building and ship-building are developed in this area.

The Western Area, which earlier included the Belorussian SSR and the Baltic Union Republics, today is confined to the Baltic Republics (Lithuani Latvia and Estonia).

The Trans-Caucasian Area remains as before: it comprises the Georgian, Azerbaijan and Armen Union Republics.

The Kazakhstan and Central Asian Area has bee spit up into two areas — the Kazakhstan and Centr Asian Areas.

The Kazakhstan Area (the Kazakh SSR) specializes in the non-ferrous metals and coal industries, grain cultivation (chiefly in the Virgin Lands Terr tory) and animal husbandry. The Central-Asian Area (made up of the Uzbek, Kirghiz, Tadjik and Turkmen SSR) remains the chief cotton-growing center of the USSR. Vast deposits of natural gas and cheap hydro-electric power have provided the basis for beginning the development of power-consuming industries.

As the boundaries of the Kazakhstan Area are identical with the boundaries of the Kazakh SSR, there is no need to establish a coordination and planning council there; the latter's functions can b successfully performed by the state planning commission of the republic, which embraces eight conomic administrative areas.

The decision of the Party Central Committee and ne USSR Council of Ministers on economic regionalzation of the USSR and the establishment of coordiation and planning councils in the large economic reas will make a fresh and important contribution) the creation of a single territorial system for ational economic planning, the basis for which was laid in 1957 by setting up economic councils in the economic administrative areas.

The establishment of coordination and planning councils coupled with the revision of the network of large economic areas will undoubtedly become a powerful instrument for improving the territorial organization of the Soviet Union's national economy.

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N INTER-BRANCH ECONOMIC BALANCE FOR AN ECONOMIC AREA

A thorough and detailed study of the economy of ach area, improved accuracy and efficiency in local conomic planning, and better methods of everyday anagement are of great importance for our couny's further economic progress. A new and proming departure in this respect is the introduction, at conomic councils and regional planning agencies, of recise mathematical techniques of planning, with ectronic computers used first for planning calculaons and later for production control.

The inter-branch production and distribution balnce now being worked out in a number of economic dministrative areas is a promising method for betr planning for an economic area. The inter-branch lance furnishes a wealth of systematized data for e economic analysis of an area's economy and can e relied upon for obtaining accurate planning estiates on the basis of mathematical methods and ectronic computing techniques.

The first inter-branch economic balance for an conomic administrative area was worked out under e guidance of Academician V. S. Nemchinov at the aboratory of Mathematical Economic Methods of e USSR Academy of Sciences. Taking one of the larged variants of this balance (Table 1) let us conder its basic features and analytical possibilities.

An integrated system of balances. Expanded production in an area's economy is a complex onomic process involving the simultaneous intertion of a multitude of economic processes and facrs. To express each of them, special forms of ysical, value and other balances have been worked t by Soviet economics. The principal feature of an inter-branch balance is that it connects all the quantitative characteristics of an area's economy and the different balances which reflect different aspects of economic activity. The method used to achieve this is the orthogonal superimposition of balances of distribution of output (lines 1 to 10 of Table 1) and of costs of production (columns 1 to 10 of Table 1). This superimposition and balancing expresses the unity of the movement of material and value forms of the social product, the unity of production, distribution, consumption and accumulation processes.

The inter-branch table integrates all the major types of balance structures used in planning the economy of the USSR. The table can, indeed, incorporate all kinds of balances.

Lines 1 to 10 of Table 1 represent a fully coordinated summary material balance of distribution of output in actual sales prices. In a more detailed table this balance can also be drawn up in physical terms. The balance contains all data on the distribution of resources: productive consumption (columns 1 to 10), accumulation (column 12), social and private consumption (columns 13 and 14) and outgoing shipments (column 15). The resources to be distributed are reflected in column 17 (gross production) and in line 12 (incoming shipments).

The national income balance for the area is represented by line 14 (payment for work) and line 15 (work for society). These lines show the primary distribution of the newly created value, while the respective columns describe its final utilization.

Each line or column can be broken down for any number of items. By dividing line and column 14, it is possible to construct a detailed balance for the population's money incomes and expenditures incorporating income in cash and in kind, as well as free services. By isolating the relevant items of line 15 and corresponding columns we obtain a detailed balance of the state budget, the circulation of State Bank funds, the budgets of institutions and organizations of the non-productive sphere.

The introduction of various additional items in the inter-branch balance enriches it and gives it new aspects, the possibilities for incorporating such items being practically boundless. For example, V. S. Nemchinov's method makes it possible to incorporate into the summary table the balance of implements of labor in inter-branch terms. (1) Other lines can reflect the utilization of manpower, production capacities and fixed assets according to types in the economic branches of the given area. The indices of the manpower line of the inter-branch balance can be used to recalculate the latter into a balance of the movement of materialized labor directly in labor units (man-hours). Similarly, this balance can be drawn up in other units of measurement, such as machine tool-hours, thousands of rubles of fixed assets, or thousands of rubles of capital investment.

The chief obstacle to the more extensive use of the balance method in planning, especially for an economic area, is the non-comparability of material, value and financial balances. The inter-branch balance may provide the key to the solution of this problem.

To make the balances of different kinds comparable, the summary material balance of distribution (lines 1 to 10 of Table 1) must be represented in a uniform type of value appraisal, say in average branch production costs. In this form the balance becomes comparable with the indices describing the primary distribution of the newly created value (lines 14 and 15). Yet it is still impossible to calculate the indices of the social product and national income in different branches since the balance of distribution is non-comparable with the balances of the state budget, the movement of State Bank funds and the population's money incomes and expenditures. The latter are comparable only with the system of inter-branch balances represented in actual sales prices which, however, essentially change the coefficients of both inputs and distribution of output, and make the balance unsuitable for detailed planning calculations. All kinds of balances are reduced to a uniform comparable form if the inter-branch balance incorporates a number of financial balances, apart from the material balances (in uniform value expression) and value balances of the primary distribution of national income. The financial balances will reflect the redistribution of the newly created value and the value accumulated in the financial system among different branches of the national economy, organizations and institutions of the non-productive sphere and different groups of the population.

The system of financial balances expressed in inter-branch terms makes it possible to study in detail the process of price formation and can be used for obtaining planning estimates in the current financing and crediting of the national econom — and in the financing of capital investment in the dynamic variant of the balance.

An economic model. Apart from being a way of summing up accounting or planning statistics, the inter-branch balance also reflects objective quantitative interrelationships which have developed i the economy of an area. The inter-branch balanc can be represented either as a statistical table or as a set of mathematical equations or inequalities In the national economy a change in any quantity (say, the gross output of a given branch) entails a number of changes in other quantities (the sum of production expenditures, deliveries to the given branch, gross output in other branches). Similarl a change in one index in the inter-branch balance begins a chain reaction changing all other indices. Inasmuch as objective economic processes are thereby simulated with a certain degree of accurac the inter-branch balance is a model of the area's economy. Just like any other model, the inter-branch balance reflects, of course, the most esse tial regularities, while relationships of secondary importance must be neglected and certain allowances must be made.

The quantitative aspect of the regularities inhe ent in the economy of an area is reflected in certain rules for the construction of the inter-branch model and in the mathematical relationship amon the different indices of the balance.

The inter-branch balance table, or in other words, the economic matrix, consists of four sections, or quadrants.

The first quadrant (including lines and columns 1 to 10 of Table 1) reflects homogeneous, comme surate, linear interrelationships of uniform group viz., the relationships among branches of production in their reciprocal deliveries of goods in the process of production. The result of this proces is the creation of the final product of the area represented in the second quadrant (a rectangle formed in Table 1 by lines 1 to 10 and columns 1 to 15). The third quadrant (lines 12 to 15 and columns 1 to 10 of Table 1) reflects all material an value expenditures in the process of production

(million rubles, actual sales prices)

Consuming Branches / Supplying Branches	Agriculture and forestry	Fuel and power industry	Timber and wood-working industries, building materials	Light industry	Food industry	Machine-building	Transport and communications	Trade, procurements and supply of materials and equipment	Construction	Other branches	Total (1 to 10)	Accumulation	Consumption		Outgoing products	Total 12 to 15	Grand total 11+16
													Social	Private			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Agriculture and forestry	639	—	—	63	461	—	—	18	—	—	1181	757	1	371	409	1538	2719
Fuel and power Industry	12	36	65	12	19	28	17	7	4	3	203	—	16	14	—	30	233
Timber and wood-working industries, building materials	17	—	148	—	13	7	11	8	137	3	344	5	24	96	201	326	670
Light industry	15	—	—	45	1	3	8	6	—	—	78	2	27	429	488	946	1024
Food industry	56	—	—	—	227	—	—	1	—	—	284	—	52	1026	676	1754	2038
Machine-building	4	—	1	—	—	—	28	1	2	—	36	6	10	4	511	531	567
Transport and communications	29	11	22	41	42	32	29	96	45	—	347	—	48	148	863	1059	1406
Trade, procurements and supply of materials and equipment	9	5	12	37	38	15	—	2	5	—	123	—	84	360	36	480	603
Construction	—	—	—	—	—	—	—	—	—	—	—	664	—	—	—	664	664
Other branches of production	2	5	—	—	2	—	1	—	1	24	35	—	12	29	—	41	76
Total (1 to 10)	783	57	248	198	803	85	94	139	194	30	2631	1434	274	2477	3184	7369	10 000
Incoming products	198	124	116	585	325	325	577	17	189	8	2534	690	41	1218	—	1949	4483
Depreciation	134	12	36	9	13	13	46	31	22	2	318	—	2	—	—	2	320
Payment for labor	1208	24	180	103	89	108	579	162	272	36	2760	—	636	—	—	636	3396
Labor for society	396	16	90	129	738	36	111	254	13	0	1757	—	90	481	—	571	2328
Total (12 to 15)	1936	176	422	826	1235	482	1312	464	470	46	7369	690	769	1699	—	3158	10 527
GRAND TOTAL (11+16):	2719	233	670	1024	2038	567	1406	603	664	76	10 000	2124	1043	4176	3184	10 527	29 527

which are not incorporated in the first quadrant: the expenditure of products shipped into the given area from other areas (line 12) and the expenditure of the implements of labor in the form of depreciation allowances (line 13). This quadrant also shows the primary distribution of the newly created value: necessary labor (line 14) and labor for society (line 15). The fourth quadrant (lines and columns 12 to 15 of Table 1) reflects various redistributive processes and above all the redistribution of the national income created in the branches of material production of the area. Apart from its economic importance as a reflection of objective processes of the distribution of value, this quadrant is vital for balancing all other quadrants since it expresses the equality of the orthogonally superimposed balances of expenditures in the production and distribution of output. It is only with the aid of the fourth quadrant that a single national economic model can incorporate such major items as the balance of the population's money incomes and expenditures, the state budget and other financial balances.

Mathematical terms must be used for determining the quantitative relationships among the elements of the economy selected as indices of the balance. A certain set of symbols has been accepted in the inter-branch balance techniques. The indices representing a certain volume of output are designated by X; the branches as producers or suppliers (represented in the lines of the balance) by i, and the branches as consumers (represented in the columns of the balance) by j. Then the gross output of a branch will be X_i and the volume of deliveries from one branch (i) to another (j) will be X_{ij}. If the number of branches in the national economy of the area is designated by m, the total volume of deliveries from the branch i to all branches of the area will be expressed as ΣX_{ij}. The final product of a branch used for non-productive consumption, accumulation and shipments to other areas is conventionally designated by Y_i. The indices of the third quardant of the table expressing different material and value expenditures (except for the expenditures on products obtained from the branches of material production of the given area) and the sum of the realized, newly created value in the branch j are designated by Z_j (or Y_j^1 in other cases), while X_j^1 denotes all gross expenditures and newly created value in the branch j (the total of its debit).

The initial premise for the construction of the inter-branch model is the assumption of linear dependence between production expenditures and output, as well as between the elements of distribution of products.

The gross output of the branch i equals the sum of inter-branch deliveries and final product of this branch, i. e.,

$$\sum_{j=1}^{m} X_{ij} + Y_i = X_i .$$

Since i is any branch of the area's economy, th model will in general incorporate a set of linear equations describing the relationships of the area branches in reciprocal deliveries. These relatio ships can be defined as technological, i.e., stable determined by the technology of production, natur resources, the location of enterprises and their specialization and cooperation.

The technological relationships are expressed quantitatively in what are known as direct expend ture coefficients designated by a and expressing t relationship between the expenditures of any kind of product and the gross output of the branch in which this product is consumed:

$$a_{ij} = \frac{X_{ij}}{X_j}$$

If each column is divided by the total of the lin corresponding to it, we shall obtain the table of direct expenditure coefficients expressing the re tionship between reciprocal deliveries and gross outputs of branches and, consequently, between gross outputs of all branches of the area. Then equation (1) will have the following form:

$$\sum_{j=1}^{m} a_{ij} X_j + Y_i = X_i .$$

The gross expenditures of a branch, plus the newly added value realized in it, can be expresse as:

$$\sum_{i=1}^{m} X_{ij} + Z_j = X_j^1 .$$

Since the sum of production expenditures and newly created value equals the value of the gross product of the branch, $X_i = X_j^1$ (provided i = j), or:

$$\sum_{j=1}^{m} X_{ij} + Y_i = \sum_{j=1}^{m} X_{ij} + Z_j .$$

For the area as a whole we shall have the equa tion:

$$\sum_{i=1}^{m} X_i = \sum_{j=1}^{m} X_j^1 ,$$

i.e., the value of the gross product of the area equals the sum of all material outlays and newly created value. This can be represented in anoth form:

$$\sum_{i,j=1}^{m} X_{ij} + \sum_{i=1}^{m} Y_i = \sum_{j,i=1}^{m} X_{ij} + \sum_{j=1}^{m} Z_j$$

It is obvious that

$$\sum_{i,j=1}^{m} X_{ij} = \sum_{j,i=1}^{m} X_{ij} ,$$

l in both cases this sum expresses the same in- x (at the crossing of line 11 and column 11 of ble 1): the sum of inter-branch deliveries. nce, we have

$$\sum_{i=1}^{m} Y_i = \sum_{j=1}^{m} Z_j, \qquad (8)$$

., the total of the second quadrant equals that of third, or the value of the total final product of area (inclusive of the physical replacement of preciation) is equivalent to the sum of expendi- es of the incoming products, depreciation allow- ces and newly created value.

The division into four quadrants, the equality of totals of the respective lines and columns of a adrant, the equality of the totals of the second and rd sections of the balance, and the expression of antitative linear interrelationships between output d costs via the matrix of direct expenditure coef- ients — such are some of the principal features the inter-branch model.

Peculiarities of the inter-branch balance for an onomic administrative area. The model which has en worked out by the Laboratory of Mathematical onomic Methods of the USSR Academy of Sciences investigating the economy of an economic admin- rative area essentially differs from foreign re- nal models above all in the object of the analysis. e latter in our case is concerned with the produc- n ties between the socialist enterprises of dif- ent branches of the national economy which are ctioning as national property under nation-wide ns. Bourgeois economics, on the other hand, als with the commercial ties of private capitalist erprises, the optimum criterion being maximum ofit. The input-output tables in Anglo-American onometrics are based on the expression of ties ween different economic sectors, including non- ductive branchss, in the purchase and sale of mmodities and services. This eliminates the quali- ive characteristics of the economic phenomena of er-branch exchange and erases the lines of de- rcation between current productive consumption, ital investment and non-productive consumption.

The firm is usually taken as the unit of observa- n by bourgeois statisticians. In this "trade bal- e" any sale of the firm's own products or some- else's products is reflected on the credit side the given branch, which distorts the actual pat- n of inter-branch ties by substituting commercial technological coefficients. In fact, the lines of s balance merely reflect the assets and the umns reflect the liabilities of several firms com- ed in the branch.

The principal ties incorporated in the model rked out by the Laboratory for an economic-administrative area are the production relationships among the branches in reciprocal deliveries of goods and services in the process of creating the total social product of the area. These ties are determined by natural and social conditions and are of a rigorously technological nature. The enterprise is taken as the unit of observation and subsidiary products which do not correspond to the enterprise's range (branch classification) are referred to the relevant branch. The model fully corresponds to the principle of construction of material balances: in each branch, as many sectors of production can be distinguished as there are separate types of output. This makes it possible to construct material balances both in physical and in value terms.

The model worked out by the Laboratory also involves a new approach to the basic problem of the regional balance, the problem of the ties between branches of the area and the economy of other areas of the country. In investigations conducted abroad this problem is solved either through the rather arbitrary division of commodity groups into "national" and "local" groups, which erases differences in the conditions of production, or through the identification of inter-branch and inter-area ties, which complicates the model a great deal and makes it useless in practice. In the model for an economic-administrative area the external ties are determined as economic ties between branches, the goods produced in the area or shipped there from outside being clearly distinguished according to their actual place of production and, consequently, their technical mode of production. Simultaneously, provisions are made for the possibility of a more detailed classification for incoming and outgoing goods by the areas of production and consumption.

Our approach to reflecting the area's total product and national income in the inter-branch balance is likewise different in principle from foreign methods. The total product is calculated in the model as the sum of goods and services created in the branches of material production and distributed in the area and outside of it: as the summation of the first and second quadrants in physical terms and as the summation of the first and third quadrants in value terms. The national income is reflected in the third quadrant as the sum of the newly created value of necessary and surplus labor. According to the methods of Anglo-American econometrics, the national income is calculated as the sum of all incomes, i.e., as the summation of the third and fourth quadrants, and the area's gross product as the sum of all created and consumed goods and services (including the servies of the branches of the non-productive sphere) i.e., as the total summation of all four quadrants. This leads to frequent double counting and distorts not only the magnitude of the area's total product and national income, but also the structure of inter-branch ties.

Inter-branch balances worked out in the USA and West European countries are based on sampling observations and interpolation of data, for commercial secrecy precludes the use of direct data. In USSR a wealth of data furnished by national economic accounting and reporting makes it possible to construct inter-branch balances for the country's national economy as well as for each separate area. The inter-branch balance represented in Table 1 for an economic-administrative area is based on the data of statistical reports of enterprises and offices, intra-departmental accounting, bookkeeping, financial accounting, etc. In addition, use was made of estimates calculated on the basis of standard specifications and direct sampling. Since no single type of accounting furnished sufficient data for constructing the balance, a study was made of the entire multi-faceted system of information in the economic area. The data furnished by the Central Statistical Administration agencies were accepted as a check, while the information from other channels was converted to a form comparable with statistical accounting.

Originally, the balances of distribution of output and production costs (credits and debits of the branch) were worked out for each branch. Taken together they made up the first section of the model. Indices of balance discrepancy (non-comparability of some of the data) were entered in special columns and lines of the outside sections. When more data had been added to these, the causes of non-comparability in each case could be detected and gross output indices for different branches calculated. Balancing the table as a whole made it possible to eliminate errors in individual branch balances and check them against the cross-reference totals of the balances of the population's money incomes and expenditures, the state budget revenues and expenditures, and the inflow and outgo of the State Bank's cash plan. The system of material and value balances, varying in degree of detail, was reduced to a uniform principle of classification and made up an inter-branch matrix of 40 x 28 branches. The consolidated variant of this table, calculated in terms of ten billion rubles worth of national product (in actual sales prices), is given in Table 1. As the work progressed the balance was made much more detailed and precise, and a number of new items were included.

Analysis of an area's total social product. By its composition and the diverse types of information it contains, the inter-branch balance table provides a good picture of the peculiarities of an area's economy and its basic proportions. An analysis of economic relations in all their aspects and a technolo ical-economic analysis of individual branches are performed with special calculating techniques.

The goods produced in an area's branches of ma terial production in a certain year constitute the area's total social product, the volume of which is calculated as the sum of the gross outputs of all productive branches:

$$\sum_{i=1}^{m} X_i = P, \ (i = 1, 2, \ldots, m) \qquad (9$$

where P is the area's total product reflected in Table 1 as the sum of the first ten lines in colum 17.

The total product can be divided into the produc consumed in the process of production (intermedia product) and final product. Hence it can be calculated as the sum of the first and second sections o of the balance:

$$\sum_{i,j=1}^{m} X_{ij} + \sum_{i=1}^{m} Y_i = P, \ (i, j = 1, 2, \ldots, m), \qquad (1$$

i.e., as the total of 2631 + 7369 of line 11. Natural in both cases the quantities P coincide, since

$$\sum_{i=1}^{m} X_{ij} + Y_i = X_i \cdot$$

The total social product in our table equals 10 billion rubles.

The inter-branch balance reveals in detail the material and value structure of the area's total product, as well as the process of its creation an utilization. The lines of the balance of distributio (lines 1 to 11) describe the material-physical con position of the total product (see column 17), whil the columns of the balance describe the utilizatio of this product in total and for each of its materia components. Relating the total of the first quadrant (line 11, column 11) and the totals of the second quadrant columns (across line 11) to the gros social product, we obtain the distribution of the area's total product in percentages:

Replacement of the objects of labor consumed	26.3%
Accumulation fund and replacement of physical depreciation	14.3%
Non-productive consumption in the area	27.5%
Outgoing products	31.9%
Total:	100.0%

Each of the above sections can be analyzed in erms of its material composition. Thus, in the ccumulation fund of the area's product, construc- on accounts for 46.3%, agriculture for 52.8%, achine-building for 0.4%, the forestry, paper and ood-working industries for 0.3%, and light industry or 0.1%.

From the standpoint of value composition, the rea's total product can be represented as the sum f internal production expenditures, all other mate- ial and value expenditures, and newly created alue:

$$\sum_{j,i=1}^{m} X_{ij} + \sum_{j=1}^{m} Z_j = P\ (i, j = 1, 2, \ldots m) \qquad (11)$$

solating further the expenditures of the objects of bor (X_{lj}), the implements of labor (depreciation llowances — A_j), as well as payment for labor (V_j) nd surplus labor (M_j), and designating by n the umber of commodity groups shipped into the area, nd by l any commodity group consumed in the area, e shall have the formula:

$$\sum_{l=1}^{m}\sum_{j=1}^{m} X_{lj} + \sum_{j=1}^{m} A_j + \sum_{j=1}^{m} V_j + \sum_{j=1}^{m} M_j = P,$$

$$(l = 1,2, \ldots, m, m+1 \ldots, n)\ (j = 1,2 \ldots m), \qquad (12)$$

hich is identical with:

$$C + V + M = P.$$

Substituting here the indices of Table 1, we obtain e equation in numerical form (in thousand rubles):

5,483,114 + 2,747,879 + 1,769,007 = 10,000,000.

The columns of the balance of expenditures make possible to gauge the ratio of material expendi- ures to the gross product for all branches of the conomy. Analysis shows that the highest propor- on of expenditures for the replacement of the con- umed means of production (from 65 to 86%) is haracteristic of the manufacturing industries. The roportion is considerably lower (from 37 to 41%) r agriculture, forestry and mining. Finally, the roportion is lowest in the distributive branches and ervices.

The volume and structure of the area's total so- ial product describes its role in the country's ational economy. From the standpoint of the crea- on of the total social product, the area's role is etermined by the composition of its gross product ee column 17 of Table 1). From the standpoint of e country's national income it is the area's final roduct that is of primary interest (columns 12 to), one portion of the final product being a com- onent of national income and the other of productive consumption in other areas of the country. The area's final product describes the "marketability" of its productive sphere. The ratio of the final product to the gross product is rather high in the area under investigation. This ratio is expressed in the relation of the totals of columns 16 and 17 across line 11 and amounts to 73.7%. The role of the area as a supplier to the country's economic branches is characterized by the volume and structure of its outgoing product (column 15). The following branches should be distinguished in the analysis of the importance of the area under investigation in the country's national economy: agriculture (relatively high gross output), food industry (relatively large final output for non-productive consumption and shipments out of the area), and railway transport (relatively large shipments out of the area in the form of transport services). Other essential economic features of the area are its machine-building and light industry.

The close ties between the area's economy and the country's national economy are reflected in the outgoing product turnover (column 15) and incoming shipments (line 12), amounting to 7,760,064,000 rubles. The large balance on incoming shipments (1,298,706,000 rubles) is due to a rapid rate of economic development, including the construction of several new large enterprises. By comparing the indices of lines 11 and 12 of Table 1 it is possible to determine how heavily certain branches of material production depend on shipments of the objects of labor from other areas. Analysis shows that the development of branches like electric power, light industry, machine-building and railway transport will bring about a sharp increase in the area's need for outside products. The development of agriculture and the food, paper and wood-working industries decreases, relatively speaking, the general need for outside products since the production expenditures of these branches can come from local resources.

A more detailed inter-branch balance table representing incoming shipments for individual commodity groups and areas of production makes it possible to carry out a detailed technical-economic analysis of the ties between the branches of the area under study and other economic areas. This provides the basis for obtaining planning estimates which would ensure better specialization of the given area under study, its economic cooperation with other areas and the best location of production.

Analysis of the two departments of social production. By revealing the distribution of the area's output the inter-branch balance table opens the way to the direct calculation of the production of the means of production and consumer goods. In the area under investigation the production of the means of production accounted for 57.1% and of consumer goods for 42.9% of the social product.

The treatment of the inter-branch balance by the V. S. Nemchinov method (2) enables us to discern the role of each branch in social production and to gauge the volume of product expended directly and indirectly (through production expenditures in other branches) on the production of the means of production and consumer goods. This method involves the transformation of the balance into a scheme of expanded reproduction for the two principal departments. The result of this transformation is presented in Table 2.

Table 2

Production Expenditures for the Two Departments of the Area's Social Production (million rubles)

Departments of social production / Branches of production	Production of the means of production				Production of consumer goods				Grand Total
	Productive consumption in the area	Outgoing shipments of means of production	Accumulation in the area	Total for department I	Non-productive sphere	Consumption of population	Outgoing shipments of consumer goods	Total for department II	
1. Agriculture and forestry	358	117	178	653	20	346	162	528	1 181
2. Fuel and power industry	78	53	8	139	7	33	26	66	145
3. Timber and wood-working industries, building materials	95	34	144	273	12	40	18	70	343
4. Light industry	11	11	4	26	1	27	22	50	76
5. Food industry	56	23	16	94	6	122	61	189	283
6. Machine-building	6	15	4	25	—	3	8	11	36
7. Transport and communications	96	41	53	190	30	83	43	156	346
8. Trade, procurements and supply of materials and equipment	25	19	7	51	3	40	29	72	123
9. Construction	*	*	*	*	*	*	*	*	*
10. Other branches	18	—	3	21	4	9	1	14	35
11. Total (1 to 10)	743	313	416	1 472	83	703	370	1 156	2 628
12. Incoming products	507	601	251	1 359	54	553	570	1 177	2 536
13. Depreciation	115	48	59	222	8	64	24	36	318
14. Total material expenditures (11 to 13) C	1 365	962	726	3 053	145	1 320	964	2 429	5 482
15. Payment for labor V	857	514	609	1 980	65	436	266	767	2 747
16. Labor for society M	408	175	99	682	63	721	305	1 089	1 771
17. Grand Total	2 630	1 651	1 434	5 715	273	2 477	1 535	4 285	10 000

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* Construction industry products are not included in current consumption.

In accordance with the data of the table the relation of the principal value elements in the area's two departments of social production can be represented as follows:

	C	+	V	+	M	=	P
Department I	3,054,026	+	1,980,086	+	680,210	=	5,714,322
Department II	2,429,177	+	767,683	+	1,088,818	=	4,285,678
Total:	5,483,203	+	2,747,769	+	1,769,028	=	10,000,000

The material outlays in the area's entire economy amount to 54.8% of the value of the social product. In the sphere of production of consumer goods they are somewhat higher (56.7%) than in the sphere of production of the means of production (53.3%), but in general they are magnitudes of the same order. The ratio of surplus to necessary product, on the other hand, differs sharply, amounting to only 34.3% for the first department and to 141.8% for th second. The value of the incoming objects of labor bulks large in material expenditures, which is quite characteristic of the area's economy. The share of the objects of labor shipped into the area in all expenditures on the replacement of the means of production consumed amounts to 44.5%, or 1,358,740,000 rubles, in the first department, and to 48.4%, or 1,176,708,000 rubles, in the second department. The volume of production of the means of production and consumer goods in the area can differ sharply from the volume of their consumption, the difference being equal to the incoming balance of shipments of both departments. Thus, in the area under investigation the consumption of the means of production amounts to 63% of total consumption, whereas their production amounts to

7% of the entire volume of production. The expla- ation is that incoming shipments consists chiefly f the means of production. The incoming shipments f consumer goods are more or less compensated or by outgoing shipments. This points to the area's pecialization in the production of consumer goods, s well as the rapid pace of its economic develop- ient.

Analysis of the area's national income. The rea's national income as a component part of the ountry's national income represents the share of ie total social product which remains after deduct- ng material expenditures. It embodies the value ewly created in the area's branches of material roduction. The national income can be expressed s:

$$D=\sum_{j=1}^{m}V_j+\sum_{j=1}^{m}M_j \quad (j=1,2,\ldots,m). \qquad (13)$$

n Table 1 the national income is expressed as the um of lines 14 and 15 in column 11 and amounts to ,517 million rubles.

The indices of Table 1 are given in the actual rices of sale. Consequently, the turnover tax has een taken into account in the prices of the prod- cts, which distorts the relative share of each ranch in the creation of the area's national income. 'o eliminate this distortion the total sum of the irnover tax was distributed among the branches in roportion to the fund for the payment of labor. Aft- r the recalculation it appeared that agriculture ccounts for 43.3% instead of 35.5% in the creation f the national income (in the actual sales prices), nd the food industry for only 3.9% instead of 18.3%.

The accumulation rate in the area must be nalyzed on the basis of the indices of the second uadrant (accumulation of the means of production roduced in the area), as well as the fourth quad- ant (incoming shipments of the means of production or accumulation). The high level of the accumula- on-to-national income ratio in the area under study 34.3%) is evidence of the rapid economic develop- ient of the area.

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We have examined only some of the aspects of the nalysis of the area's economy via the summary ble of the inter-branch balance. A whole series of ther trends of economic analysis are opened up if se is made of the tables of direct and total expendi- ire coefficients, tables of inter-area ties and bles of production capacities and fixed assets, es- entially supplementing the inter-branch balance of ie area. Their use involves the application of spe- ial techniques making it possible to calculate ssentially new indices describing both structural elations in an area's economy as well as the rates and proportions of development of individual branches.

With the aid of the inter-branch balance, the analysis of the principal national economic proportions and synthetic indices (total product, national income, the principal subdivisions of social production) can be coordinated with a detailed technical-economic analysis of individual branches of production, labor productivity, technical standards, the location and specialization of production, and inter-area ties.

The investigation of the economy of economic-administrative areas with the aid of economic models gives us a deeper insight into the workings of the objective economic laws of socialism. The inter-branch area balance tables worked out for the Mordovian Autonomous Republic and Kaliningrad economic-administrative area furnish a wealth of data for improving techniques of economic analysis and for solving specific national economic problems. The same may be expected from the inter-branch models to be worked out for the Kiev economic area, the Karelian Autonomous Republic and some other areas of the country.

Speaking on the results of the Meeting of Representatives of Communist and Workers' Parties held in Moscow in November 1960, Comrade N. S. Khrushchev pointed out: "The Statement of the Meeting emphasizes the need for steady improvement of political and economic work, constant perfection of the methods of the leadership of the national economy, scientifically substantiated socialist management. Our practice also confirms the fact that the correct solution of these problems is of considerable importance. We pay special attention to the solution of the problems of economic leadership with objective conditions taken into account, to the prevention of either excessive running ahead or slowing down of the pace of development." (3)

Under these conditions, questions of improving economic planning in every possible way become more important than ever. Exact mathematical methods of planning with the application of electronic computers, and the system of inter-branch production and distribution balances, constitute, in our opinion, one of the most promising trends in national economic planning, economic management and current production control. These factors will, no doubt, play a positive role in our country's further economic progress.

Footnotes

(1) V. S. Nemchinov, "Theoretical Problems of the Inter-Branch and Inter-Regional Balance of

Production and Distribution," a report delivered at the Conference on Application of Mathematical Methods in Economic Research and Planning, Moscow, 1960.

(2) See article by Academician V. S. Nemchinov in Voprosy Ekonomiki, 1958, No. 10, and the collection *Primenenie matematiki v ekonomicheskikh issledovaniiakh*, Moscow, 1959.

(3) N. S. Khrushchev, "Za novye pobedy mirovogo kommunisticheskogo dvizheniia," *Kommunist* 1961, No. 1, p. 12.

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Price Policy and Price Statistics

Voprosy Ekonomiki, 1961, No.

E. Tiapkina

DIFFERENTIATION OF PURCHASE PRICES BY ZONES

The January (1961) Plenum of the Party Central Committee pointed out that it is necessary to ensure a continuous growth in agricultural production so that the population's growing requirements for farm and animal products are fully satisfied and production is always ahead of demand. Improvement of the system of state purchases and purchase prices, with due consideration to the local natural and economic conditions of agricultural production, is expected to play a huge role in achieving this goal.

Agriculture is a complex branch of material production with its own specific features. The collective farms carry on production under diverse natural and economic conditions, expending an unequal quantity of living and past labor on a unit of output. This brings about considerable differences in individual costs of a unit of output in the collective farms of a given zone or region.

However agricultural output is sold not on the basis of individual costs but according to a uniform purchase price reflecting average zonal expenditures of labor for its production. It is therefore important to determine under what natural and economic conditions given expenditures of labor are socially necessary.

Inasmuch as under socialism not only the best and average but also the worst quality soils have to be cultivated to meet social needs, labor expended under relatively worse conditions is socially neces sary. Here it is not a question of the least produc tive expenditures of labor on the poorest soils, bu of costs in the category of enterprises in the least favorable conditions of production of a given type of product with an average level of labor producti ity. In order not to undermine the economic found tions of a farm, this labor should be given public recognition when compensating production outlays on agricultural output through prices, with due account to ensuring a definite rate of income for expanded reproduction. Consequently when planning prices the differences in the natural and economic conditions under which the collective farms opera should be duly considered. These conditions are so very different that it is very difficult to accoun fully for them. For this reason the influence of natural factors on production costs are actually calculated zonally. In this sense the relatively worse inter-zonal conditions of production are a regulating factor in forming prices for agricultur products. Within the zones prices are establishe on the basis of average zonal production conditio It is therefore very important when determining t boundaries of the price zones to make sure there are no sharp soil and climatic differences which can cause substantial variance in the level of labo productivity and production costs. However a co parative analysis of the basic economic indices o the collective farms of the RSFSR for the years 1956 to 1959 indicates that in planning purchase

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ices inadequate account is still taken of the ac- al differences in production outlays on a unit of ricultural output produced under the differing tural and economic conditions of given regions, tonomous republics and areas, between zones, well as within individual zones. This leads to arply differentiated profitability in agricultural oduction and diminishes the economic effective- ss of the state funds spent on the purchase of ricultural products.

Indeed the relationship between the higher and wer levels of zonal purchase prices for grain as tablished in 1958 for the different zones is 1:1.7. the same time the level of production costs, lculated over a period of several years (1956- 59) changes within a range of more than 1:5. As consequence differences in the gross income per it of land area in the extreme zones, despite the solute growth of collective farms incomes for e indicated period, have been rather significant.

Taken as a whole purchase prices for food prod- ts in 1958 assured, apart from covering costs lculated with regard for the uniform money ap- aisal of remuneration for labor, 48% profitabil- , and in the case of industrial crops — 110% ofitability. The profitability of certain types of dustrial crops exceeded 150%, and for sunflower amounted to 363%. This means that when sell- g sunflower seeds to the state the collective rms not only realized their full value but also ceived in the price a substantial part of the rplus product created in other branches of the tional economy. At the same time in such an portant branch of agriculture as animal hus- ndry production costs were not covered in nearly all the zones. This reduces the economic incentive for developing livestock breeding.

Insufficient differentiation of prices by zones as well as the sharp divergencies in the relationship of prices for certain products cause great differences in collective farm incomes by zones. We present below data for eight zones of the RSFSR for 1958.

Price zones	Number of regions and autonomous republics	Per 100 hectares of agricultural land (in % of average level)			Level of Profitability or losses
		Gross output	Production costs*	Gross income	
I	1	307.0	235.8	312.0	39.9
II	5	140.9	117.7	127.9	28.2
III	6	163.2	167.5	119.9	2.3
IV	10	75.7	69.9	67.3	10.2
V	9	75.6	69.8	67.1	12.1
VI	26	141.5	116.9	79.8	-12.9
VII	5	31.8	33.3	27.8	-13.0
VIII	3	99.9	108.7	91.4	- 4.7

* In calculating production costs in the collective farms actual expenditures must be taken into account. In this instance, for comparison's sake, production cost indices utilizing normative wage rates were used.

Thus of 65 regions and autonomous republics in the RSFSR, possessing more than 52 million hectares of agricultural land, 29 did not cover production expenditures on the average by approximately 13%. In zone III the level of profitability from collective farm production of all varieties of agricultural produce was more than 100% below the average. In zone II, however, it exceeded the average by 400% and in zone I — by over 600%.

As a consequence of the sharp differences in income, given the present system of distributing the gross product in the collective farms, the volume of internal accumulations and actual payments for labor are not the same. In some regions, territories and autonomous republics the actual cash assessment per man-day is 200 to 300% below that of others which enjoy more favorable natural and economic conditions for production. All this reduces the material incentive of the collective farms and collective farmers to increase output, sets up unequal conditions for raising the mechanization of labor and increases the gap in its productivity.

This necessitates greater differentiation of prices by zones within the limits of the sum total of purchase prices for agricultural products, which is determined by the proportions of the balance of the national economy as a whole with due account of the essential level of profitability of agricultural production. This calls for a more accurate determination of the areas of the price zones with due consideration to the specific natural and climatic conditions of individual districts of the country. Division of agricultural territory into zones when planning prices on a territorial and geographic basis is evidently unjustified since this involves very great differences in the incomes of collective farms. We present below data characterizing average profitability in the production of basic products in the collective farms of zone VI of the RSFSR for the period 1956 to 1958.

	Group I *		Group II		Group III		Group IV	
	Rate of Profitability (in %)	Regions in the Group	Rate of Profitability (in %)	Regions in the Group	Rate of Profitability (in %)	Regions in the Group	Rate of Profitability (in %)	Regions in the Group
Farm products								
Grain (excluding maize)	71.9	9	21.6	8	-13.4	4	-31.7	5
Potatoes	133.9	10	62.6	13	15.9	2	-24.2	1
Sunflower	388.6	1	233.6	1	97.8	1	30.6	1
Sugar beet	150.0	1	77.4	6	—	—	—	—
Animal husbandry products								
Milk	7.2	6	-10.7	9	-18.4	8	-28.5	3
Beef	8.3	2	- 3.3	10	-14.4	7	-23.9	7
Mutton	- 7.5	3	-28.9	11	-39.7	10	-51.9	2
Pork	-18.4	3	-35.1	13	-44.0	5	-50.4	5

* In this table, as well as in the one following, for comparing indices of profitability for the groups of regions, payments for labor have also been estimated in money terms on the basis of the wages of state farm workers; the figures with the minus signs characterize the percentage of losses.

More accuracy in the boundaries of price zones, along with a more clear-cut differentiation of purchase prices, would tend to equalize the economic possibilities of the collective farms in paying for labor, carrying out additional investments, etc. For this purpose the materials of the soil and climatic surveys,of the zonal commissions for founding a system of conducting agriculture in different areas of the country, as well as indices for agricultural production covering many years should be used.

It is just as important to provide the necessary economic conditions to enable collective farms to conduct their commonly-owned economies on an expanded basis within the zones, regions and area Intra-zonal differences in production conditions i some groups of collective farms in a region are far greater than between neighboring zones and regions. This is evident from the economic appraisal of land in a number of regions. Furthermore inter-zonal divergencies in the cost of agricultural products are taken into account, even if inadequately, when planning prices. In the Gorky Region the economic appraisal of the land has not yet been completed. However the grouping of collective farms into various agro-soil zones reflect considerable deviations in their income levels corresponding to the size of internal accumulatio and actual payment for labor. The table below shows the changes in average profitability in all branches of the publicly-owned economy, depending on soil differences, in the respective collecti farm groups from 1957 to 1959 (calculated per 10 hectares of arable land; in thousands of rubles).

Within its present boundaries the Gorky Regio is divided on the basis of soil differences into seven zones. The collective farms referred to groups I, II and III in the table are located withi the zone with less favorable conditions for production, the differences inside the zone being very substantial. The collective farms in group V enjoy better natural and economic production conditions and for this reason, in selling their produce on the basis of a uniform price per 100 hectares of arable land, obtain a net income four times greater than the average for the region and almost seven times more than in all the groups. In group I, whose collective farms possess relatively poor lands with less nourishing matter, less cultivated soil, productivity is low and costs of production are high. Therefore the gross income, calculated per unit of cultivated land, is almost five times below the average for the region and ten times below that of the collective farms in group V.

individual zones of the region are not taken into account when planning prices and are not fully considered when fixing income taxes for collective farms. At present the difference in the income tax per unit of land area within the region is only about 10% compared to the difference in incomes due to the influence of natural rent-forming factors.

The collection of income taxes from collective farms which actually have no net profit worsens their economic position still more. Their debt to the state grows, payments for labor are reduced and there are no funds with which to purchase machinery. For this reason the volume of output per 100 hectares of land grows slowly, and in some cases either remains stable or even declines.

Consequently in planning the volume of purchases and price levels more consideration should be given to the natural and economic conditions in order to ensure for all collective farms the optimum conditions for profitability.

Groups of collective farms according to conditions of production	Collective farms in the group	Value of gross output	Total expenditure	Gross income	Net income	Level of profitability (in %)	Actual payments for labor (in % of group I)
I	23	9.8	13.8	1.8	-4.0	-28.3	100
II	32	11.6	14.0	3.8	-2.4	-17.0	120
III	55	14.5	14.9	6.1	-0.4	- 2.3	150
IV	34	20.3	17.3	10.3	3.0	17.6	205
V	22	33.4	25.2	18.6	8.2	33.3	297
Average for groups	166	18.1	16.9	8.3	1.2	6.8	180
Average for region	—	14.9	13.0	8.1	1.9	15.0	—

Fixed differences in income bring about sharp differences in the payment of labor: in group I it is three times less than in group V. In some collective farms with sharper differences in the quality of the soil, location, etc., the divergencies are still greater. Yet an analysis of the dynamics of agricultural crop yields shows no substantial differences in the quality of labor in these groups of collective farms.

An analysis of the profitability of agricultural production in the groups shows that 66.3% of the collective farms (groups I-III) operated for three years at a loss, while the collective farms in group V, with more or less the same cultivated area as the collective farms in group I — which enjoyed better production conditions — were highly profitable.

Obviously the inequality in economic conditions for expanded reproduction in the different collective farm groups is due to shortcomings in distributing differential rent, inasmuch as the above-mentioned natural and climatic features in the

In order to consistently realize the principle of self-sufficiency, normal renewal and expansion of production it is essential, apart from sound calculations of the planned level of production costs in setting prices and income taxes, to also provide the essential conditions under which all collective farms will receive net income. This leads to the question of how more or less equal economic conditions for reproduction can be provided in practice for all collective farms and what should be the optimal level of profitabllity within the limits of the overall net income of the collective farm sector, that is, the available financial resources used for the purchase of agricultural products?

An economic analysis of the mass data for the zones, regions and collective farm groups confirms the necessity of transferring the differential rent I to the disposal of the state. Leaving a part of it to a definite group of collective farms gives rise to unjustifiably high profitability and does not encourage economy and raising the economic fertility of the soil. At the same time some collective farms in less favorable production conditions must build up accumulations by reducing the personal consumption fund and this lessens the material incentives for increasing agricultural production.

Economists offer us two ways of removing the intra-zonal differentiation of collective farm incomes: the first is to set the purchase price on the basis of the production costs of the group of farms in relatively less favorable conditions, applying progressive income tax rates; the second way suggested is to effect intra-zonal price differentiations by groups of farms. However to fix prices on the basis of expenditures under the worst conditions of production would lead, on the one hand, to excessive redistribution of incomes in the form of direct taxation by differential rates of income tax and, on the other, to raising retail prices or to the need for subsidies to the respective branches of the food industry, above all the dairy and meat industry. The second way, in our view, is also unacceptable since it is difficult to carry out in practice, and in addition would result in weakening the incentives for improving specialization.

The basic factor in levelling out economic conditions for reproduction is the establishment of economically substantiated price zones and price levels. It is also important to apply the method of statistical grouping of collective farms in the zone, region or area with the relatively best, average and worst production conditions.

The practical advisability of such groupings results above all from the fact that it promotes economically sound planning of prices, helps to establish the volume of purchases, as well as correct taxation of the collective farms. Furthermore the level of the average zonal purchase price should be determined in such a way that, apart from covering production costs in the less favorable conditions, it will ensure that production is not being conducted at a loss and that essential accumulations are being created for expanded reproduction.

In the groups of farms with average and more favorable conditions for production a higher share of incomes, acquired from the rent forming factors, can be withdrawn through a differentiated volume of state purchases and income tax.

As is known, 80% of the incomes of the collective farms from animal husbandry from 1961 to 1965 is tax-free. This will help to strengthen the financial position of the collective farms and develop livestock breeding. In addition, in adjusting the relationship of price levels for agricultural products, it is necessary to do away completely with losses in animal husbandry and to apply within the zones the differential income tax rates for all types of agricultural output.

Practical experience has shown that in order to effect complete self-sufficiency when planning prices and the level of profitability for the groups of farms within the zones it is desirable to provide for a net income which will remain in the collective farms after channeling a part of it to the public centralized funds. It should amount to 25 to 30% of the normative level production costs, with certain deviations depending on the economic significance of specific products.

With the establishment of average zonal purchase prices at a level ensuring a minimum accumulation in enterprises with less favorable production conditions only a small group of farms will not enjoy the necessary economic conditions for reproduction even if they are exempted entirely from income tax payments. In this case, on the basis of the previously indicated groupings, incomes could be corrected by a more differentiated approach in planning purchases, bearing in mind that the redistribution of the surplus product depends upon the relationship between the non-marketable and marketable parts of the gross product.

The new contracting system makes possible a more differentiated approach to the planning of marketable produce with due consideration to the concrete production conditions prevailing in each collective farm. It would be wise to have farms in worse conditions, which are unable to cover costs of production, make deliveries in a way which would enable them to sell a large part of their surplus produce on a commission basis at local market prices. This naturally should be regarded as a temporary measure designed to give the economically weak collective farms more material incentive to lift their social economies.

Hence in order more effectively to use state funds spent on the purchase of agricultural products and to further strengthen the commonly-owned sector of the collective farms it is necessary, in our opinion, to carry out the following measures for improving the planning of prices for agricultural products: eliminate the excessive, economically unjustified variance in rates of profitability when fixing prices for different products: define more accurately the zonal price areas and differentiate further the purchase prices for the various zones of the country; establish average zonal, relatively stable prices for agricultural products on a level which will ensure farms operating under less favorable production conditions the necessary accumulations and full coverage of planned-normative production costs. It is essential to apply differential, relatively stable income tax rates on the collective farms on the basis of net income, with due account to the withdrawal of the differential rent I in favor of society, and to give marketable roduction assignments to collective farms in less avorable conditions which will make for the creaion of better income conditions.

The present system of contracting purchases nd improving the organization of marketing surlus agricultural products, along with greater diferentiation in prices and income taxes, provide good opportunities for stimulating collective farm interest in a continuous growth of production, raising labor productivity and reducing prices for farm and animal products. It provides the conditions for raising the incomes and strengthening the social economies of collective farms, and for improving the well-being of the collective farmers.

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RGENT PROBLEMS OF WHOLESALE PRICE STATISTICS

Questions of prices and price formation occupy n important place in the economic policy of the arty and the Soviet Government. Planned price ormation in the hands of a socialist state is an nstrument for the conscious application of the law f value for developing and consolidating the ecoomic might of our national economy.

Broad statistical coverage is an indispensable rerequisite for the correct solution of the intriate questions of price formation. One of its aramount tasks is to study the regularities and endencies characteristic of Soviet price formaon.

Considered below are certain urgent but as yet nresolved questions pertaining to this important ranch of statistics.

Statistical Observations of Temporary and One-Time Prices

In 1958 the Soviet Government introduced a new rocedure for the fixing of wholesale prices of inustrial products. The rights of republic and cal organs in the sphere of price formation were reatly extended, which made for more effective olution of many questions related to the organizaon of the output of new products.

The economic councils are now empowered to x temporary wholesale prices for certain types products which their enterprises are in the rocess of mastering, such as machine-building ems of an operational and construction nature, rts needed for assembling this production, invidual types of chemical output and building marials, etc. The directors of industrial enterrises have the right to fix prices of commodities oduced on single, one-time orders. These rices have come to be called one-time prices.

The new price formation procedure has required the establishment of an effective control system to supervise the price policies of local organs with a view to guaranteeing the unity of price regulation and the avoidance of artificially high prices. This has also been required by the interests of retaining common principles of price formation in the socialist economy.

In view of this the Central Statistical Administration of the USSR has been charged with the organization of systematic statistical observation of the changes in prices fixed by republican and local organs. During the past few years the Central Statistical Administration has organized comprehensive statistical observation of all the permanent wholesale prices of goods and services ratified by local organs. The question of organizing supervision over temporary and so-called one-time prices, however, has not been solved so far.

However the relative importance of these prices in the existing system of prices is growing in connection with the accelerating rates of technical progress and the increasingly changing composition of output.

The systematic statistical observation of onetime and temporary wholesale prices will help in the study of the emerging level of prices of new products, the profitability of producing new goods and its dynamics. This supervision will permit us to solve more correctly and successfully the problem of the correct price relationships between the new and most recent products on the one hand, and similar commodities whose output has already been mastered on the other. A thorough analysis of statistical data obtained in the course of these observations will make it possible to determine the optimum periods for the operation of temporary and permanent prices in different branches of the national economy and the optimum deviation of prices from the level of production costs. Finally, the systematic statistical study of one-time and temporary wholesale prices will make for the quick detection of cases in which the established price formation procedures are violated.

Of greatest importance is the accounting of one-time and temporary prices. This is necessary, specifically in order to bring to light cases in which the high level at which one-time and temporary wholesale prices are fixed is economically unjustified. Especially detrimental to the rates of technical progress and the cost accounting of industrial enterprises are instances of fixing unjustifiably high one-time and temporary prices for components and parts supplied under the cooperation plan. This practice raises the cost of the end product and impairs the economic indices of the major producing plants. There have been cases when the major producing plants have simply refused to accept the component parts delivered to them under the cooperation plan and have undertaken to produce the parts themselves. The production costs of these goods are higher than if they had been produced at specialized enterprises, but lower than their existing wholesale prices. That is why it is very important to determine, in analyzing the level of one-time and temporary prices, the price relationship between the new and most recent products on the one hand, and similar commodities whose production has long been mastered or which are about to be discarded from production on the other.

It was noted at the July (1960) Plenum of the Party Central Committee that certain designing organizations provide for the use of old machinery and technology in new projects, although more advanced machinery and technology already exist. This often happens because the temporary wholesale prices of the new production are fixed on the basis of the generally very high individual production costs of the first models or consignments. Sometimes, in comparing projects one of which provides for new machinery and the other for old plant, the latter proves to be more advantageous. This happens because of the excessively high wholesale prices of new machinery, which, in turn, influences depreciation charges. These depreciation charges frequently prove to be so high that they negate the effect received from the application of the new machinery. The per unit cost of output in this case turns out to be higher than that of the commodities produced with the use of old equipment.

One-time and temporary price accounting is also important from the standpoint of solving the problem of creating and maintaining such a relationship between prices of old and new products as would always operate in favor of the latest, advanced models, both from the standpoint of the producers and the users.

Prices must reflect actual costs of production and ensure a definite level of profitability for the enterprise. But this by no means indicates that they should be changed as often and in the same proportions as costs of production change. In suc a case the enterprises would not be interested in reducing their production costs. However it woul also be incorrect to retain in prices for too long a time the cost relationships established in the past among various types of goods. Of late, the existing wholesale prices have remained practically unchanged, and as a result they have grown to be divorced from their base. In its decision, the July (1960) Plenum of the Party Central Committe noted, with regard to wholesale prices and rates, that "a considerable part of these does not reflect the changes that have occurred during the past few years, changes linked with the improvement of production and its provision with new machinery; it has ceased to correspond to actual production costs." The Plenum felt it was necessary, in vie of this, to revise the wholesale prices of implements and means of production in the course of 1961 and 1962 so as to make the new prices reflec more correctly the actual costs of production and ensure the necessary accumulations for the furthe expansion of industry. Statistical analysis of changes in the costs of production of industrial ou put and the prices of this output, including one-time and temporary wholesale prices, makes it possible to determine the optimum relationship between them.

One of the tasks confronting the statistical stud of one-time and temporary wholesale prices is that of bringing to light actual instances of violation of the price formation procedure approved by the government. In particular, there are rather frequent cases when the time limits set for temporary prices are not observed. Sometimes the economic councils and planning bodies drag out th ratification of draft wholeaale prices of new products submitted to them, which also retards the supply of new machinery to its users. There hav been cases when the economic councils sold certain goods at temporary prices whose term had long expired.

The use of comparatively high, temporary whol sale prices for a long period leads to the exaggeration of the volume of gross and marketable outpu the rate of growth of labor productivity and the reduction of production costs. It is also worth noting that if planned assignments for production costs of industrial output are fixed on the basis o outlays per ruble of marketable produce, the sale of goods whose output has already been mastered at temporary, comparatively high prices permits the supplier enterprises to fulfill rather easily their planned assignments for the reduction of production costs and places the enterprises purchasing this output in a difficult position.

Such violations of the accepted procedure for
rice formation bring the supplier plants unjusti-
ably high profits, permit them to easily overfulfill
e planned assignments for reducing costs per
ble of marketable output, for the production of
oss and marketable output in value terms. In the
nal analysis this impairs the principles of eco-
mic accounting and narrows the range of utiliza-
n of new products.

By decision of the Party Central Committee and
e USSR Council of Ministers, the economic coun-
ls, ministries and departments under whose
risdiction are included machine-building and
etal working enterprises, have been given the
ght, as of January 1, 1961, to create a new ma-
inery fund with savings derived from production
osts. From now on all outlays on designing work,
etooling and other preliminary expenses connected
ith preparations for the production of new types of
tput must be made from this fund. In view of
is, the level of temporary wholesale prices of
ewly-mastered types of machine-building and
etal-working products must be fixed in conformity
ith the level of existing wholesale prices of prod-
cts mastered earlier or of machines of similar
esign or purpose, with regard for their capacity
d efficiency.

This means in actual practice that the wholesale
rice of new products must in any case not exceed
e price of the machinery produced earlier in
rms of per unit capacity, weight-lifting capacity,
roductivity, etc. There may be allowances for
e higher quality of the new machine.

All this heightens the significance of the system-
ic statistical observation of temporary and one-
me prices, i.e., prices of new products.

In organizing this supervision, the question of
hether the statistical agencies should undertake a
mprehensive or partial registration of prices
tified by the republican and local bodies arises.

Constant, detailed statistical supervision over
l the one-time and temporary wholesale prices
isting in all the branches of the national economy
not feasible in actual practice because of the
emendous number of such prices. Selective
ethods of surveying must, apparently, find broad
plication in this field. How should this super-
sion be organized?

S. Stoliarov's article published in *Vestnik*
atistiki, 1958, No. 11 and his book *On Prices and*
rice Formation in the USSR (Gosstatizdat, 1960,
. 63-64) suggest that the selective registration
prices of means of production be conducted ac-
rding to nomenclatures approved by the statis-
cal agencies. Such a registration, however,
ould encounter several difficulties. The nomen-
atures, apparently, should include the most typ-
al goods produced in each given republic, terri-
ry or region. This means that the nomenclature
lists would differ in content. At the same time, prices of homogeneous products, ratified by different organs and existing in different areas of the country, must be compared if we are interested in a really thorough analysis of price formation processes. It is not always possible to do this if we must deal with different nomenclatures. Nor would it always be possible to compare the prices of mutually replaceable products, given this method of investigation. Furthermore the statistical study of prices of goods not included in the nomenclature list would be rendered difficult. Finally statistical observation according to the method suggested by S. Stoliarov would gradually produce a situation in which changes in prices of goods included in the nomenclature list would no longer reflect the movement of all prices ratified by republic and local organs because of the appearance of new, hitherto not produced goods. The periodic reappraisal of the above lists would lead to the narrowing of the range of commodities whose prices could be compared over a period of several years. In general, even the very compilation of such lists would be very difficult for the statistical agencies; the volume of production of this or that product cannot serve as a criterion for its inclusion in the list.

We hold that a substantial basis for the study of prices and price formation requires a comprehensive registration of prices and rates fixed by republican and local organs, although the processing of this material should be done in a selective manner.

The need for statistical data on the prices existing in various branches of the national economy arises periodically in every given sector. In this connection the greatest interest is always attached to the prices of goods which at the given time are of greatest importance from the standpoint of the growth of the national economy. At present, for instance, we need exhaustive data on the prices of new types of products being turned out by the machine-building, chemical and building materials industries. That is why in our opinion the statistical agencies, rather than scattering their resources and efforts, should concentrate on that part of the single price system from which data are required at the given moment. Thus it is a matter of the detailed and thorough investigation of some part of the existing price system, even if a small part in any given case. This is precisely what is made possible by comprehensive registration and a selective analysis of prices.

Moreover price data must in all cases be supplemented by information on the production costs of the commodities in question and the profitability of their production, both in general and in separate economic areas, and sometimes even at individual enterprises. Without this the statistical investigation of prices cannot serve as a sufficiently reliable basis for the analysis of existing prices. The collection of production cost data will not be difficult because the enterprises that produce goods whose prices are being revised or ratified submit cost calculations to the organs that approve these prices. Therefore the corresponding statistical agencies can obtain the relevant production cost figures simultaneously with the registration of prices. This data will permit the state statistical agencies to analyze the prices established not only from the standpoint of their conformity to the prices set earlier for other commodities, but also from the standpoint of their conformity to costs of production. What is more, this data will facilitate the task of determining the range of goods to be subjected to subsequent selective analysis.

Nor will it be difficult to obtain data on the production costs of goods included in the list subject to selective analysis for the period coinciding with the period of analysis, inasmuch as the number of enterprises that will have to submit such figures will be very limited in each case. For all intents and purposes this can be done by including these goods in nomenclature form no. 1 ("Reference note on the sale of industrial output according to groups of products"), or in the nomenclature supplement to form no. 6 ("Reference note on the profitability of the basic types of industrial products"), or finally, by appropriate questionnaires.

It would be very desirable to combine the selective analysis of data on one-time and temporary prices with the selective investigations that the Central Statistical Administration carries out on the introduction of new machinery, cooperation and specialization in the national economy.

The System of Wholesale Price Indexes

It is superfluous to demonstrate the paramount importance of the index method in all branches of statistical work. But this method is of particular importance for statistics of prices and price formation. Figuratively speaking, the index method is the heart of price statistics. The biggest lag, however, has been observed precisely in this sector.

From the standpoint of economic content price indexes can be divided into four large groups. These are, first, indexes of the retail prices of state and cooperative trade and indexes of rates for services extended to the population; second, indexes of collective farm market prices; third, indexes of wholesale prices and rates for services rendered to state and cooperative organizations, and finally, indexes of purchase (collective farm) and delivery (state farm) prices of agricultural produce, or indexes of procurement prices.

We now have a wealth of experience in calculating indexes of retail, procurement and collective farm market prices. The methods of calculating these indexes are sufficiently sound. This cannot be said of the indexes of wholesale prices, although more or less successful attempts to calculate ther have been made lately. Above all, it is not clear what kind of indexes should be calculated.

We hold that the following groups of wholesale price indexes should be available to characterize changes in wholesale prices in the national economy:

1. Indexes of wholesale prices of the output of individual branches of the national economy. For instance: indexes of wholesale prices of the products of the coal industry, indexes of wholesale prices of the products of the textile industry, etc.
2. Indexes of wholesale prices of raw material for the industries processing them. For instance an index of wholesale prices of raw materials for ferrous metallurgy, an index of wholesale prices of raw materials for the chemical industry, etc.
3. Indexes of wholesale prices of machine-building products for branches of the national economy receiving them. For instance: an index of wholesale prices of machinery and equipment for agriculture, construction, railway transport, etc.

Within each of these index groups it is necessar to calculate individual indexes for separate commodities or commodity groups of primary importance for the national economy — indexes of wholesale prices of gas, oil, pig iron, high-grade steel electric power, etc. As a whole, the system of price indexes must be constructed so that the indexes reflect the price changes in all the principa product spheres of the national economy, both fro the standpoint of the producers and the consumers of these goods.

Of great economic significance is the comparison of wholesale price indexes for the output of certain industries with the wholesale price indexe of different types of this output used as raw materials in other branches of the national economy. These indexes can serve to analyze the changes i the production costs and prices of this industry's finished products depending on the changing wholesale prices of raw materials. It must be borne i mind, however, that the general indexes of wholesale prices of goods that are regarded in one cas as finished products and in another as raw materials can never coincide. For instance, the inde of wholesale prices of the output of the metallurgical industry can never coincide in magnitude with the index of wholesale prices of raw materials fo the machine-building industry, although metal is the basic raw material used in this branch of production. The main reason why these indexes do not coincide is, on the one hand, that the metallurgical industry supplies metal not only to the machine-building industry, but also to the transport services, construction, agriculture, etc., nd on the other hand that the machine-building inustry receives as raw materials not only metal, ut also certain types of chemical, timber, textile nd other industry products. Moreover, the diferences between the indexes also stem to a certain xtent from the differences between prices based on tation of destination and prices based on station of rigin.

While the general indexes cannot coincide, the ndividual indexes for certain concrete commodities r groups of commodities may coincide.

Calculation of Wholesale Price Indexes for Comparable and Non-Comparable Production

The difficulty of calculating price indexes for ndividual industries is linked, above all, with the eed to solve the problem of comparability of maretable products in the accounting and base periods. This problem does not arise in practice in such ranches as the extractive industry (coal, oil, imber, etc.), ferrous and nonferrous metallurgy, he building materials industry, electric power tations, etc., as well as in most branches of the ight and food industries. The composition of outut changes substantially with the passage of time, owever, in the machine-building, in many ranches of chemical production, and in certain ranches of the light and food industries. That is vhy wholesale price indexes of fixed composition an be calculated for industries in the first group oth for a set of representative commodities and or the aggregate of comparable marketable prouction — which in this case will be practically dentical with all the marketable production — while n the machine-building industry and other branches he calculation of wholesale price indexes is limited o a narrower range of comparable goods.

The price index calculated for the aggregate of omparable marketable production is based on the armonic mean index formula. In this case the set f commodities for which we must know the volume f output in money terms or in kind is determined rom the range of goods whose prices have changed uring the period under consideration. Data on omparable marketable production in existing rices can be obtained from the periodic bookkeepng reports.

Here is an example of how the index is calcuated:

Let us suppose that the wholesale prices (excludng the turnover tax) of commodities A and B prouced by local industry have been reduced as of uly 1st of the current year: 30% for commodity A nd 20% for commodity B. Proceeding from the ata of statistical and bookkeeping reports (form o. 1, for example), we determine that the share f these goods in the aggregate of marketable prouction of the given branches of local industry in actual prices for the first half of the year amounts to 27% for A and 14% for B. The figures for the second half of the year are 21% and 12% respectively. The share of other products in this industry amounts to 26%.

Now we find the average annual wholesale price index relative to the base year according to the following formula:

$$I= \frac{p_1 q_1}{\frac{1}{i} p_1 q_1}$$

If we take the sum of all the comparable production of the given branch of local industry in actual prices of the year under consideration as 100%, the wholesale price index will equal:

$$I= \frac{100}{27 + \frac{21}{0.7} + 14 + \frac{12}{0.8} + 26} = 0.893, \text{ or } 89.3\%$$

The influence of the subjective factor is completely ruled out in calculating the price index according for the entire aggregate of marketable output. Another unquestionable advantage of this method is the comparative simplicity with which the index is derived.

However the basic indexes calculated according to this method for branches of industry where the comparable output is smaller than the total volume of marketable output will be less exact the greater the difference between the volume of comparable output and total marketable output. A serious shortcoming is that with an extension of the period for which the index is calculated, the range of goods for which we must know the volume of sales also increases. That is why it is more correct to calculate the basic indexes for an extended period according to a set of representative commodities, although in this case we must allow for some influence of the subjective factor.

For some industries in which prices are differentiated either by zones (the timber industry), or basins (the coal industry), or regions, territories and autonomous republics (the sugar industry), etc., we must calculate, in addition to price indexes of fixed composition, price indexes of variable composition, i.e., indexes which take into account changes in the share of individual districts in the total volume of sales of one or another type of product. Only this type of index can furnish some idea of price changes on a national scale. However wholesale price indexes of variable composition have not been calculated so far. In general, the experience in the use of this type of index in price statistics is limited to the practice of calculating collective farm market price indexes.

Calculation of wholesale price indexes of variable composition, although more complicated than the calculation of fixed composition indexes, is perfectly feasible. For this purpose it is necessary to have data on average sales prices for each concrete commodity in the current and base periods. But to determine the average sales prices themselves, it is also necessary to have the regional (zone, basin, etc.) prices of the goods in question during the current and base periods, as well as data on the volume of sales of these commodities in each individual region (belt, basin, etc.). The regional prices are given in the corresponding price catalogues. The main difficulty is that of determining the weights to be used in calculating the average prices, i.e., obtaining data on the volume of sales of concrete commodities in individual areas. This question is easily solved in calculating collective farm prices indexes — all the initial data is provided for by special accounting reports. There are no reports, however, on the volume of sales for different zones, basins, etc. On the other hand, however, the list of goods produced in industries for which the wholesale price index of variable composition must be calculated is, as a rule, comparatively small. This circumstance makes the calculations much easier. Moreover, while the collective farm market price indexes should be calculated monthly, inasmuch as rather substantial structural changes may occur in sales of one or another product during this period, wholesale price indexes of variable composition need not be drawn up more than once in three to five years. Substantial structural changes are not likely in shorter periods. This makes possible the collection of all the required data on the production of commodities in different areas of the country before we get down to actual calculation. But in individual cases we shall nevertheless have to resort to other data, even if it only indirectly characterizes the volume of sales of the commodity in question (data on output, data from the special accounting reports of republic supply and sales departments, etc.).

The calculation of the basic indexes by the usual method is impossible in practice in industries with a small volume of comparable marketable output. The rapid changes occurring in the composition of output in the machine-building, chemical and certain other industries, do not even permit us to select a more or less representative range of typical commodities for the base and current periods, let alone the use of accounting data on comparable output in value terms. Machine-building output, for instance, undergoes considerable change rather often — every two or three years. Heavy machine-building consists almost entirely of such items. With the stepped up rate of technical progress the percentage of rapidly renewed output in the gross output of manufacturing industry increases steadily. But perhaps in this case it is possible to calculate a chain index of wholesale prices by the usual method? No, it is not. Calculation by the conventional method of chain indexes of prices for the various branches of the machine-building, chemical and other industries will not reflect the actual changes in the structure of wholesale prices. One of the principles underlying Soviet planned price formation is that of ensuring a definite stability of prices. Permanent wholesale prices, as we know, remain the same for approximately five to eight years. That is why the prices of goods which have been produced for comparatively short periods practically do not change. Consequently, chain indexes for these branches of industry will always be close to unity.

At the same time, since prices of means of means of production are fixed on the basis of production costs, and the production cost of the new output in the period of its quantity production is relatively lower than the cost of the commodities it is to replace, the permanent wholesale prices of the new output will be relatively lower than the prices of the old output. In other words, prices in machine-building, chemical and other industries are changed to a certain extent not by modifying the existing permanent prices, but by fixing comparatively lower prices for the new types of output

Consequently, wholesale price indexes calculated for a range of comparable output the composition of which undergoes substantial changes annually, may lead to conclusions at variance with the actual state of affairs.

The problem of bringing to light such price changes arises only when we calculate wholesale price indexes for branches of manufacturing industry. Retail and procurement prices of new products are always fixed not only, and not so much, on the basis of their production costs, but rather in conformity with existing prices of other similar goods. Moreover, of great importance in the establishment of retail and procurement prices are the existing relationships between demand and supply.

In the extractive industry non-comparable production, i.e., new types of commodities, arise out of the emergence of completely new social requirements which they are called upon to meet. The replacement of one type of production by another is in effect ruled out here. In other words, only the number of types of output increases in these industries.

The price changes indicated above can be brought to light in our view by means of certain additional calculations. We have in mind the possible application of the method of "conventional comparability." What is more, this method makes for a considerable expansion of the range of omparable commodities and extends the time limit or the comparability of goods.

This method is based on the determination of the ossible price of an obsolete commodity which is o longer produced, on the supposition that it will neet one or another requirement to the same deree as the new type of commodity which has gone nto production.

This possible price can be determined in two vays. The first consists of determining the price er unit of power output, hoisting capacity, perentage of the useful substance contained, producivity, etc., of the old and new type of output. 'hese prices are used to calculate the individual rice index per unit of the given use value. Let us esignate the power output, hoisting capacity, perentage of useful substance, productivity, etc., of he new and old commodities as K_1 and K_o, and he price per unit of the new and old product as P_1 nd P_o. The price per unit price of the given usealue will be equal in the current period to $\frac{P_1}{K_1} = p_1$, nd in the base period to $\frac{P_o}{K_o} = p_o$, while the indiidual index will be equal to $i = \frac{p_1}{p_o}$.

The second method is to increase the price of the ld commodity to the extent that the power output, oisting capacity, etc., of the new commodity exeeds that of the discarded product. If

$$= \frac{p_1}{p_o} = \frac{P_1}{K_1} : \frac{P_o}{K_o} = \frac{P_1}{P_o} : \frac{K_1}{K_o}$$, we shall get

$= \frac{P_1}{P_oC}$ if we denote $\frac{K_1}{K_o}$ by C, where P_oC is the ossible price of the old commodity assuming that meets the concrete requirements to the same egree as the new product.

It is obvious that these two methods are based on he same principle, but the technique of calculation s simpler in the second case.

In addition to the problem of comparability, cerain other difficulties of a practical nature also rise in calculating the wholesale price index for utput which is priced by the local and republican gencies.

The main difficulty is that of determining the olume of sales of output the prices of which are xed by local and republican agencies, as well as he volume of sales of output the prices of which ere altered by these agencies during the period nder review. This data cannot be obtained directfrom accounting records, among other reasons ecause existing accounting records very often inude in the same group of commodities goods hose prices are ratified both by local and republic agencies as well as by central agencies. For example, rates for electricity and thermal power generated by communal electric power stations with capacities of below 1,000 kilowatts and used for industrial, technical and lighting purposes, are fixed by the councils of ministers of the autonomous republics and by the territorial and regional executive committees. The republican ministries and the economic councils ratify rates for the electricity generated by stations that are under their jurisdiction and are not connected with the power systems. Rates for the electric and thermal power produced by all other electric stations not included in power systems, as well as rates on electricity generated by communal electric power stations with capacities above 1,000 kilowatts, are fixed by the councils of ministers of the union republics. Rates for electricity and thermal power produced by all the stations included in the power systems are set by the State Planning Committee of the USSR. Moreover, as a rule the rates are differentiated depending on the purposes for which the electricity is supplied. Rates for industrial and transport needs are lower than for other organizations and for the population. It is obvious, therefore, that to calculate indexes of rates for electric and thermal power fixed by the republic and local agencies it is necessary to have data on the supply of these types of power to different categories of consumers by all the above enumerated groups of electric power stations.

A great deal of initial data is also required to calculate indexes of wholesale prices for other commodity groups. However the volume of accounting records would have to be greatly increased in order to obtain this data directly from such records. This is not desirable. It is more correct to proceed from indicators in the data available in the accounting records, provided of course that the necessary accuracy can be assured. Such indicators are, first of all, figures on the output of the commodities in question in money and in kind, data on the sales and production of individual commodity groups, and the like. When the number of enterprises producing goods whose prices are included in the index is not large, it is possible to use data from the primary accounting records of these enterprises. The calculations, moreover, can make use of data contained in materials submitted by the enterprises to the appropriate agencies when the prices of their products are changed.

It goes without saying that all the data used to calculate indexes of wholesale prices and rates fixed by the republic and local organs can also be used to calculate general indexes of wholesale prices for branches of industry.

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Theory of Rent

Voprosy Ekonomiki, 1961, No. 6

P. Bashkin

DIFFERENTIAL GROUND RENT IN SOVIET COLLECTIVE FARM PRODUCTION

Study of the operation of the law of differential ground rent under socialism has great theoretical and practical significance. Research into this problem, in our view, should be based on practice as the principal method of studying the laws governing the Soviet economy. Only such an approach makes it possible to find correct solutions for the theoretical and practical problems of differential ground rent in socialist society.

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Certain economists, drawing on individual statements in the classics of Marxism-Leninism regarding differential ground rent in capitalist society, conclude that since capitalism does not exist in our country differential rent as an economic category does not exist under socialism. (1)

The same conclusion is drawn by Academician S. G. Strumilin. Citing Marx's statements with regard to the necessary prerequisites for the existence of ground rent under capitalism, he writes in his article "Differential Ground Rent Under Socialism": "None of these prerequisites for ground rent exist in the USSR either in the public or collective farm sector of the socialist economy. No one will be able to discover in the collective farms either the free competition of 'capitals' or the possibility of shifting them to other spheres. And, most important of all, land ownership is alien to them. Hence without this indispensable prerequisite there can be no talk of any sort of ground rent." "In Soviet conditions the abolition of private ownership of the land and all the other means of production is accompanied by the destruction of the law of the equal rate of profit and with that all prerequisites for the formation of ground rent disappear." (2)

Indeed capitalist ground rent as one of the forms of surplus value does not and cannot exist under socialism. This is an indisputable truth which requires no proof. But socialism, while eliminating capitalist production relations in agriculture, creates a new system of social relations. A characteristic feature of agrarian relations under socialism is that owing to the existence of two forms of socialist property — public and collectiv farm-cooperative — land ownership is still somewhat separated from agricultural production. As an object of ownership the land belongs to the who of society and as an object of economy it is mostl used by individual collective farms. This gives rise to a definite system of economic relations between society as a whole as the owner of the land and the collective farm peasantry which uses the land as an object of agricultural production.

The relations existing between society as a who and the collective farms with regard to the production and distribution of agricultural produce on land constituting public property are subordinated to the requirements of objective economic laws operative in the Soviet economy. One of these laws, in our opinion, is that of differential groun rent, which expresses the essential features of relations between socialist society as a whole and the collective farms concerning the production an distribution of the extra surplus product created in the collective farms using the most fertile and best situated land. The requirements of this law are taken into account in the practical activity of the Communist Party and Soviet Government and, above all, in setting purchase prices for collectiv farm output.

It need hardly be said that the law of differentia rent operating in the collective farm sector of pr duction differs fundamentally in its social essenc nature and consequences from the law of differential rent in capitalist conditions. Under socialis differential rent does not constitute the product o exploitation of wage labor by capital, a source of unearned income derived by landowners. Sociali differential rent is a product of unexploited labor it is used in the interests of the collective farm peasantry and socialist society as a whole. Unde capitalism the law of ground rent has a wide sphe of operation, embracing not only agriculture but also certain branches of the mining industry, as well as urban and rural construction. Under socialism the sphere of operation of the law of differential rent is much narrower, embracing only collective farm production, which has not yet reached the highest stage of socialization.

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The last circumstance is responsible for a cer-
in separation of collective farm agricultural pro-
iction from public land ownership. As a conse-
ience of the fact that the land as an object of
vnership belongs to the whole people and as an
oject of economy is a monopoly possession of col-
ctive farms, there must exist rent relations be-
veen society as the owner of the land and the col-
ctive farms as the subjects of the cultivation of
is land and the owners of the produced output.
here is no basis for the existence of rent rela-
ons when society as a whole is both the owner and
ller of the land, when the use of the land is not
eparated from land ownership. This refers, in
rticular, to the state farms and also to the min-
g industry, where the entire output, including the
irplus obtained from the best lands, belongs to
ociety as a whole. No specific relations arise in
onnection with the output and distribution of this
roduce. Thus the law of differential rent, in our
ew, operates in the USSR only in the sphere of
ollective farm production. As the two forms of
ocialist property approach one another, and they
erge into a single communist property, the sepa-
ation of agricultural production from land owner-
ip, which still exists under socialism, will dis-
ppear. The land as an object of ownership and as
object of economy will be in the hands of the
hole of society only when it becomes a single, or-
nized association regulated according to plan.
hen this is achieved, wrote Marx, differential
ound rent will disappear.

Differential ground rent in the USSR is not a form
payment to the state by the collective farms for
e right to use the land. Hence we cannot agree
th those economists who regard ground rent in
e USSR as an economic realization of land owner-
ip. The working class, collective farm peasant-
, all of the working people of our country have
e same relation to the land as the chief means of
oduction in agriculture. The land occupied by
llective farms is secured to them for their use
ee of charge and for an unlimited time; it cannot
sold or leased.

The equal relation of all working people to the
nd under socialism means equal pay for equal
rk on this land. Yet the differences in the fer-
ity and location of the land and its assignment to
dividual collective farms put these farms in an
equal position. Thus the collective farms using
e best land as an object of their economy receive
gher incomes than the collective farms cultivat-
relatively worse soil. The high incomes de-
ved from the cultivation of better land cannot be
nopolized by the given collective farm. A defi-
e part of these incomes must go to society and
used in the interests of all the working people.
wever the income which goes to the whole of so-
ety cannot be regarded as payment for the land or as a form of economic realization of land ownership.

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Marxism-Leninism teaches that differences in natural fertility and the location of plots of land in relation to markets constitute the natural basis for the appearance of differential ground rent. These differences continue to exist under socialism. However some Soviet economists maintain that under socialism the differences in the natural fertility of land disappear and there remains no basis for permanent, fixed differential incomes arising from differences in natural fertility. Thus M. M. Sokolov writes: "There are no poor conditions of production under socialism. There is good work and bad work." (3) We cannot share this view. Land as a means of production has its own specific features distinguishing it from other means of production. It has, first, a relatively stable diversity of natural fertility which cannot be fully eliminated; and, second, it possesses non-reproducible qualities. The differences in natural fertility and location can be evened out, but it is impossible to remove them altogether. At present these differences have a great influence on labor productivity in agriculture. We cite below some data on the collective farms in the Omsk Region (Table 1).

The soil and climatic conditions prevailing in the Omsk Region (stretching for nearly 800 kilometers from north to south) vary widely. On the basis of their differences we divided all the collective farms of the region into four groups. (4) The collective farms belonging to the first group are located in the northern taiga area and conduct their economy in the least favorable natural, climatic and geographic conditions. The soil here is predominantly sandy. The sowing begins 15 to 20 days later than in the southern part of the region and the autumn frosts set in 15 to 20 days earlier. Moreover the collective farms of this group are located 300 to 500 kilometers away from the railway and the city of Omsk. The collective farms in the second, northern forest-steppe group use more fertile podsol soil and, most important of all, are closer (100 to 200 kilometers) to the railway and the city. The most favorable conditions are enjoyed by the collective farms of the third and fourth groups, which are located in the southern part of the region. They have fertile Siberian black-earth steppe lands and have all of the prerequisites for highly productive utilization of tractors, combines and other farm machines. The only difference between these two groups is that the collective farms of the third group are situated around Omsk and along the railway line, while those of the fourth group are 50 to 100 kilometers away from the railway and the city.

Consequently essential differences in natural

Table 1*

Groups of collective farms	Number of collective farms in the group	Their share in grain production (in %)	Basic means of production per hectare of grain crops (in rubles)	Man-days expended per hectare of grain crops	Average annual per-hectare grain yield for 1957-1959 (centners)	Average annual production costs per centner of grain in 1958-1959 (rubles)	Average annual sale price per centner of grain in 1958-1959 (rubles)	Income (+), loss (-) (rubles)	The same as % of production costs
Northern taiga	124	11.9	970	9.5	7.1	58.20	43.54	-14.66	- 33.5
Northern forest steppe	34	21.5	1,066	9.1	9.2	39.92	55.00	+15.08	+ 37.8
Southern forest steppe	63	34.0	1,088	8.7	13.9	30.09	59.57	+29.48	+ 99.7
Southern steppe	42	32.6	924	8.4	14.3	29.53	60.32	+30.79	+104.0

* The table is based on the annual reports of the collective farms of the Omsk Region for the years 1957 to 1959. Production costs of grains are computed according to methods recommended by the USSR Ministry of Agriculture. Cost indices in the table and in the article are given in old rubles.

fertility and location of plots of land exist even within the limits of one region. As for the economic fertility of the land, which, as is well known is determined by the amount of labor expended per unit of cultivated land and the degree of its technical equipment, there are no essential differences between them, as is apparent in Table 1.

There are no essential differences between the collective farms in the level of mechanization of grain production. Ploughing, sowing, harvesting, threshing and many other operations are mechanized in all of the collective farms. The differences in labor outlays per unit of cultivated land are explained not so much by different levels of technical equipment as by the influence of natural and climatic conditions on the effectiveness of machinery utilization. Thus the differences in fertility and location of plots of land continue to exist. Being exceptionally important factors, determining the relatively higher or lower level of labor productivity in agriculture, these differences constitute the natural basis of differential rent. Equal outlays of materialized and living labor on plots of land of varying natural fertility and location yield different amounts of produce (see Table 1). Thus yields in collective farms c the fourth group are more than twice as high as in the first group. Such a difference in yields, our opinion, is attributable not to economic differences but chiefly to the natural fertility of the soil. On more fertile soil labor is more productive and creates an extra surplus product which constitutes the material basis of differential ground rent in the collective farms.

The different levels of labor productivity result- from the differing natural fertility and location land used by collective farms leads to differen- tion in production costs and rates of profitability. is is confirmed by the figures cited in Table 1. e lowest grain production costs and the highest ofitability rate are registered in the collective rms of the third and fourth groups, where natural d climatic conditions are most favorable. In llective farms of the second group the profita- ity rate in grain production amounts to 37.9%, ile in the first group grain production is carried at a loss.

It should be noted that the collective farms of the st group are distinguished not only for the high- grain production costs but also for the lowest nual average price for its sale. In the final anal- is the different level of selling prices is also termined by differing soil, climatic and geo- aphical conditions of the collective farms. In llective farms of the first group the share of eat in grain production amounts to nearly 60%, remaining 40% being accounted for by winter e and oats, the prices for which are lower than wheat. Moreover earlier autumn frosts lower quality of grain. In 1959, for instance, the sses incurred by the collective farms of the re- on from delivering lower-quality grain totaled million rubles.

Situated 300 to 500 kilometers from Omsk, the llective farms of the first group find it unprofit- le to sell their grain at the collective farm mar- t. The collective farms in the southern part of region enjoy more favorable conditions for ising wheat of the finest grades, the share of ich in total grain production exceeds 90%. oreover, taking advantage of their relative prox- ity to Omsk, these collective farms sell part of eir grain at higher prices on the collective farm rket.

Thus the soil, climatic and geographical condi- ns influence the productivity level and profita- ity rate of collective farm production in two ys: more favorable soil and climatic conditions ke for lower production costs and higher selling ices, and vice versa. This is precisely what nstitutes the natural basis for the sharp differ- tiation in the profitability level of collective farm oduction.

Some economists deny the existence of differen- l rents in Soviet agriculture and recognize only differential profitability of collective farms. ademician S. G. Strumilin, for example, writes t "differential 'profitability' of different plots of d remains, but differential rent does not ist ..." (5) According to these economists dif- rential profitability of various plots of land has thing to distinguish it from the differential in- mes of industrial enterprises and state farms. Hence, they assert, there is no basis for singling out the extra surplus product created on the most fertile plots from other parts of surplus product and, moreover, to regard it as a special economic category.

We cannot agree with this assertion. A higher differential income is created by the introduction of advanced techniques, technology and more efficient organization of production, that is of factors accessible to all enterprises, the collective farms included. However such income may arise on a more stable basis — on the basis of monopoly possession of the most fertile and most favorably located tracts of land, which are not available to other collective farms owing to the limited quantity of the best land. In this case the collective farms cultivating the best land are able for a long time, and without expending more effort than collective farms working poorer land, to derive higher incomes.

Therefore, not all differential incomes are similar in their origin and essence. Differential incomes derived from more favorable natural, climatic and geographical conditions exist not only in collective farms but also in state farms and enterprises of the mining industry. However in the state farms and mining enterprises there is no need to distinguish them from other parts of the product because all of their output is placed at the disposal of the whole society.

The situation is quite different with respect to differential surplus income of collective farms. Possessing in a certain sense a monopoly of the land as an object of economy (which is strictly protected by society and the state) and working this land with the help of their own means of production and manpower, the collective farms are naturally the owners of all the produce raised on this land, including the extra surplus product resulting from the use of the most fertile and best situated lands.

The question arises: to whom should this surplus product belong — to the collective farm or to society as a whole? Its appropriation by collective farms occupying the most fertile and best situated lands would put them in an exceptionally advantageous position in comparison with collective farms cultivating relatively less fertile and unfavorably located lands, as well as with state farms and mining enterprises whose surplus differential income is appropriated by society as a whole.

Thus differential income derived by collective farms from the use of the best lands gives rise to specific relations between socialist society and the collective farms, between the working class and the collective farm peasantry and between the collective farms themselves. This is precisely why this income cannot be identified with the differential incomes of state enterprises and state farms. Owing to the specific nature of agrarian relations under socialism, the differential income of collective farms stands apart from other types of income, assuming the form of differential ground rent.

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The existence of differential rent as a relatively stable surplus income of collective farms cultivating better lands is possible only if collective farms sell their produce not at individual value but at a higher social value. The question of what production costs (on inferior, average or the best land) determine the social value of agricultural products under socialism is one of the cardinal problems of the theory of ground rent in socialist conditions.

Elaborating the theory of capitalist ground rent, V. I. Lenin wrote: " ... Since all the land is occupied by farmers and since the demand is for the total amount of grain produced on the entire land, including the worst plots located far away from the markets, it is understandable that the price of grain should be determined by the cost of production on the worst land ... " (6) Some Soviet economists believe that this thesis is inapplicable to the conditions of socialism. Under socialism, in their opinion, the cost of agricultural products, as that of industrial goods, is determined by the average conditions of production. S. G. Strumilin writes that "the prices of agricultural, as of any other, produce ... in the planned economy should be based, according to the law of value, on the average labor and production conditions prevailing in the economy as a whole." (7) Orientation on the cost of collective farm output produced in the worst conditions, according to S. G. Strumilin, would raise the prices of farm products far above the level of the actual labor expenditure in agriculture as a whole.

However the Soviet state is guided by a different principle in fixing prices on collective farm produce. The decision adopted by the Plenum of the Party Central Committee in June of 1958 states: "The need to cover the outlays of the collective farms, proceeding from the average zonal conditions of production, to increase labor productivity, to reduce production costs and create the necessary accumulations for expanded socialist reproduction must be taken into account in determining the level of new procurement prices." It is quite obvious that the point of view of those economists who substantiate the need for setting the prices of collective farm produce on the basis of the average social conditions of production does not conform to the principle formulated in this decision.

Differentiation of purchase prices and the division of the country into various price zones are based on the principle of the relative similarity of natural, climatic and geographic conditions of production. The setting of purchase prices in areas with more or less similar natural and climatic conditions of production should be based not on lagging or advanced collective farms, but on th economic development level prevailing in the majority of collective farms, i. e., on the average zonal conditions of production. It is clear that thi also applies to zones with relatively poorer natural and climatic conditions of production. If the prices were based on the average social conditions rather than the average zonal conditions of produc tion, the output of many products in these zones would be deliberately condemned to operating at a loss. A great many collective farms in these zones (and not only the lagging ones, but also thos organizationally and technically advanced) would not be in a position even to achieve simple reproduction. Of course we should not go to another extreme in solving the problems of price formation. As N. S. Khrushchev noted at a session of the USSR Supreme Soviet in March of 1958, it wou be impossible to adjust the prices to the weak and lagging collective farms, for this would give excessive advantages to the advanced collective farms as compared with the majority of collective farms at the expense of the interests of industry and the entire socialist economy.

If, however, we proceed from the principle that the value of agricultural products under socialism as some economists (notably, M. M. Sokolov) believe, is determined by the so-called "typical production costs" (8) (i. e., by the labor outlays of those farms which produce a major part of the given output) and set purchase prices in accordance with this value, this would place thousands o collective farms under the threat of ruin. In the Omsk Region, for example, 66.6% of the total amount of grain is produced by 105 collective farms located in the southern part of the region. The average annual production cost of a centner of grain in these collective farms comes to about 30 rubles. If we accept these costs as "typical" or "social" and set grain prices according to then the question arises as to how the majority of the collective farms, located in the northern part of the region (158 farms), could conduct their economy, considering that their production costs for grain are almost twice as high as the "typical."

Most of the grain in our country is grown in the Kuban and Don areas, the Ukraine, Kazakhstan and Western Siberia, where its cost of production is two to three times lower than in collective farms located in less favorable natural and clima ic conditions. The setting of prices on the basis of "typical" production costs would place the rest of the collective farms (i. e., the majority of then in a grave economic position. This is apparent from the example of 124 collective farms located the northern part of the Omsk Region (see Table 1

Although the purchase price for grain is more an double the production costs of collective farms cated in the southern part of the region and pro- icing most of the grain, it nevertheless does not ver the production costs of the collective farms tuated in the northern areas of the Omsk Region. ne average annual (1958-1959) loss per centner grain there amounted to 14.66 rubles. As S. G. rumilin put it, the remuneration of labor in these llective farms proved "more than meager" — ss than half the amount paid by collective farms the southern areas. In 1959 the average in- ease in the non-distributable funds of all the col- ctive farms in the region amounted to 12.4%, d contributions to these funds accounted for .1% of the cash incomes, whereas the non-dis- ibutable funds in collective farms of the first oup rose by only 4% and contribution to these nds amounted to 12%.

If the country's requirements in grain were sat- fied by the output of areas enjoying the most vorable soil, climatic and geographic conditions, e value of grain would then be determined by the oduction conditions prevailing there. But the untry also needs the grain produced in areas th relatively inferior soil, climatic and geo- aphic conditions. Hence the social value of ain is determined by the production costs pre- iling on the less fertile and unfavorably located nd. Determining the value of agricultural prod- ts on the basis of the production costs on the orst lands is an objective necessity in the condi- ons of collective farm production. And we be- eve that the Communist Party and Soviet Govern- ent are also guided by this objective requirement their price policy for collective farm produc- on. Deviation from this requirement, orientation the so-called "typical production costs" would evitably place thousands of collective farms in ave economic positions and would give rise to the ed for making these farms "dependencies" of ciety, which contradicts the very essence and ture of the collective farm system.

It is not accidental that S. G. Strumilin has been rced to recognize the objective necessity of set- ng purchase prices on the basis of the production sts prevailing in collective farms conducting eir economy in relatively worse natural and geo- aphic conditions, although this contradicts the sence of his position in questions of price forma- on for agricultural output. He writes that "our ices for products of the land are by no means anned according to the level of outlays on the orst lands, as is claimed by the proponents of fferential rent under Soviet conditions." At the me time he asserts the opposite: "... The de- ery prices must, above all, fully compensate ch collective farm for its *individual* outlays on aterial costs and remuneration of labor within the limits of the established norms, and, over and above this individual cost of production (c + v), also include a certain share of accumulations (m) placed at the disposal of each collective farm for independent use within the limits of the general plan ..." (9) Since the reference here is to each collective farm, it is apparent that S. G. Strumilin does not exclude the collective farms cultivating the relatively worse lands.

It is pointless to argue whether the price should fully cover the production costs of each collective farm. We think that if individual production costs in a particular collective farm are above the socially necessary ones determined by the outlays of past and living labor on relatively less fertile and unfavorably located lands, the price must not cover them in full.

Thus the social value of agricultural products even under socialism, in our opinion, is determined not by individual but by socially necessary outlays of labor, i.e., by labor outlays on less fertile and unfavorably located plots. Society cannot disregard this objective requirement of covering outlays even on the worst lands as long as there exist separate collective farms cultivating lands of varying fertility as an object of agricultural production. The social value of grain raised on lands of differing quality is determined not by individual, not by average but by socially necessary outlays of labor, i.e., by labor outlays on the worst lands.

The difference between the social value of grain obtained from the best and average lands and its individual value is exactly what constitutes differential ground rent. In conditions of socialism, with the existence of the collective farm form of production, there remains the objective necessity for the payment of differential ground rent to individual collective farms. This is apparent from the data presented below relating to the collective farms of the Omsk Region (see Table 2).

It is evident from the table that the individual average annual value (10) of grain sold in the collective farms of the Omsk Region totaled 323,306,000 rubles, while the actual proceeds amounted to 372,551,000 rubles. The collective farms of the first and second groups sold their grain at 29,040,000 rubles below the individual value, whereas the figure for collective farms of the third and fourth groups was 72,285,000 rubles above the individual value. The difference between the individual value of grain produced by collective farms on the best land and its selling price, set by the state on the basis of the social value of grain, constitutes differential ground rent, which is placed at the disposal of collective farms possessing a monopoly on the best land as an object of their economy. If the purchase price of grain is raised to the level of its individual cost in

Table 2*

Groups of collective farms	Grain sold (tons)	Individual average annual value of grain sold (thousands of rubles)	Individual value per ton (rubles)	Actual proceeds from grain (thousands of rubles)	Selling price per ton (rubles)	Difference between individual value and selling price (- negative, + positive)
Northern taiga	73,255	59,634	814.80	31,882	435.40	-27,752
Northern forest-steppe	146,322	81,765	558.80	80,477	550.00	- 1,288
Southern forest-steppe	224,707	94,647	421.20	133,838	595.70	+39,191
Southern steppe	211,130	87,260	413.30	126,354	598.40	+39,094
Total	—	323,306	—	372,551	—	-29,040 +78,285

* The table is based on the annual reports of the collective farms of the Omsk Region for 1958-1959. The rate of profit (40%) in grain production is the actual average for the country.

collective farms of the first group, thereby eliminating the losses in grain production sustained by these collective farms, then the differential rent received by collective farms of the second, third and fourth groups will increase from 78,285,000 to 211,000,000 rubles.

Thus, if the prices of agricultural products are based on the average economic conditions, this will put the collective farms cultivating relatively inferior land in a serious economic position. But if the prices of all agricultural products are set according to the conditions of their production on the worse lands, this will result in higher ground rent.

What is the way out? It was indicated with the utmost clarity in the Party and government decisions, notably in the decision of the Plenum of the Party Central Committee of June, 1958, which determined the differentiated prices of grain and other products according to zones, taking into account the soil, climatic and geographical conditions obtaining in each zone.

Higher purchase prices ensuring coverage of production costs and certain accumulations for expanded reproduction have been fixed for zones with the least favorable natural and climatic conditions Lower purchase prices were introduced for zones enjoying the most favorable natural and climatic conditions, the aim being to prevent inordinately high incomes at the expense of other branches of the national economy and the society as a whole.

This is the only correct price policy, based on the Marxist-Leninist theory of ground rent and on the rich experience of socialist agriculture.

Naturally the present system of zonal purchase prices must be improved and perfected. It seems to us, on the basis of the factual data on the collective farms of the Omsk Region, that it would b expedient to introduce certain changes in the zona division of the country. For instance, the fourth grain-price zone now includes the Cheliabinsk, Kurgan, Omsk, Novosibirsk, Kemerovo, Irkutsk Tomsk and Tiumen Regions, and the Altai and Krasnoyarsk Territories. The establishment of uniform price for grain for such an extensive zone, as is evident from the example of the collective farms of the Omsk Region, places the collective farms in unequal conditions. The collective farms located in the southern part of Wester peria receive rather high incomes from grain oduction, while those in the northern part culti- te grain at a loss. In our view it would be ex- dient to exclude the northern districts of Western peria from the fourth zone and place them within special price zone, where the prices of agricul- ral products would be somewhat higher than the esent level. In the southern areas of Western peria, on the other hand, the prices of grain ould be somewhat reduced, since their present vel ensures a rather high profitability rate in ain production and hardly contributes to the owth of labor productivity and economic progress this branch of agricultural production. The in- oduction of these changes would strengthen the onomies of the collective farms in the northern eas and would somewhat reduce the level of ound rent received by the collective farms in the uthern areas of Western Siberia.

Footnotes

1. See for example the collection Z'emel'naia Renta v Sotsialisticheskom Sel'skom Khoziaistve, Gosplanizdat.
2. Voprosy Ekonomiki, 1960, No. 7, pp. 95, 84.
3. Zemel'naia Renta v Sotsialisticheskom Sel'skom Khoziaistve, p. 48.
4. In dividing collective farms into groups we were guided, in the main, by the soil map of Western Siberia compiled by K. P. Gorshenin, the distinguished Siberian soil scientist and Lenin Prize winner.
5. Voprosy Ekonomiki, 1960, No. 7, p. 84.
6. V. I. Lenin, Soch., Vol. 5, p. 108.
7. Voprosy Ekonomiki, 1960, No. 7, p. 87.
8. Zemel'naia Renta v Sotsialisticheskom Sel'skom Khoziaistve, p. 52.
9. Voprosy Ekonomiki, 1960, No. 7, pp. 91, 90.
10. The individual value of grain is defined as the sum C + V (that is, production costs) plus 40% of profit (the actual average for the country).

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Comparisons of Soviet and Western Economies

Voprosy Ekonomiki, 1961, No. 7

Notkin

IE PRESENT STAGE OF ECONOMIC COMPETITION BETWEEN THE USSR ID THE CHIEF CAPITALIST COUNTRIES

The forthcoming 22nd Party Congress will adopt ew Party program, a program for building a mmunist society. The comprehensive building communism in our country proceeds under the nditions of economic competition between social- n and capitalism. In this connection a com- rison of indices characterizing the economic wer and level of economic development of the SR and the chief capitalist countries is of paramount importance.

The concept of economic power is widely current in Soviet economic literature, and per capita output is often taken as its yardstick. From this point of view small but industrially highly developed countries should be regarded as more "powerful" than the big industrial powers. Thus between 1957 and 1959 per capita national income averaged $1,257 in Switzerland, $1,055 in Luxemburg, $993 in Britain, $817 in the Federal Republic of Germany, and $853 in France. (1) Is it possible to conclude from this that Switzerland or

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Luxemburg are economically more powerful countries than Britain, the Federal Republic of Germany or France? Of course not. A country which has attained higher norms of per capita output may be less powerful economically than a country with a lower output per head of population. Here the analogy with military power is completely appropriate. If we leave aside the morale factor, the country which possesses a larger army and a larger amount of up-to-date armaments is more powerful militarily, irrespective of the amount of armaments per head of population. The concept of a country's economic power expresses first of all the absolute size of its productive forces and output. In point of fact, the economic power of a country is the productive capacity of its national economy. The USSR surpasses in economic power the chief capitalist countries of Europe, although the level of per capita output in some of them is as yet higher than in our country.

The concept of economic power includes not only the quantitative element but the qualitative as well; the development of the basic branches of production, which determine the nature and level of the productive forces, An agrarian country with a large population can produce a larger national income than a country with a smaller population which, however, is to a considerable extent employed in industry, but it does not follow from this that such a country is more powerful economically. Thus India's national income in 1958 was 26.1 billion dollars while Japan's was 23.6 billion dollars; nevertheless the economic power of Japan, which in 1959 accounted for 3.5% of the industrial output of the capitalist world is as yet greater than that of India, whose industrial output is 2.1% of the industrial output of the capitalist countries. What is of decisive significance in estimating economic power in the present instance is not the total volume of a nation's gross and net product, but the output volume of commodities that are the product of present-day productive forces. With respect to the development of electric power, machine-building, the chemical and other basic branches of contemporary industry India is as yet far behind Japan, though it is rapidly advancing on the road of modern industrialization.

Hence the quantitative and qualitative elements characterizing the economic power of a country may not coincide. In such cases the volume of industrial output, and in particular that of heavy industry, as a rule determine the relative economic power of the particular country as compared with other countries. It is also characterized by the absolute increase in the social product, the national income, and in industrial and agricultural output. Absolute increases in output attained by a country reflect the availability of economic resources and the possibility of their employment for economic expansion. The latter is determine to a decisive degree by the social system.

The level of a country's economic development characterizes the state of its economy from the quantitative aspect. In this we cannot do without indices of per capita output. Neither the absolute size of the productive forces nor the volume of th social product and national income can by themselves serve as yardsticks of the level of a country's economic development. The size of the population must also be taken into account. The national income of Luxemburg, which has a population of 300,000, or of Switzerland, with a population of five million, testifies to the relatively hig level of economic development of these countries. But the very same national income for a country with a population of tens of millions would be an index of economic backwardness. In 1958 the rat capacity of all electric power stations in the Netherlands was equal to 4,483,000 kw., and in India 4,369,000 kw. But in the case of the former the figures indicate a comparatively high level of ele trification, and in the case of the latter — a low level. The level of a country's economic development is manifested in the amount of accumulated per capita social wealth, the level of technical equipment and labor productivity, and in the nor of output and consumption per head of population. All of this is closely related to the structure of t national economy. Predominance in an economy backward forms of agriculture, primitive trades and forms of industrial production condemns a country to a low level of technical equipment and labor productivity, and to low per capita norms o production and consumption.

The totality of these indices — the amount of a cumulated social wealth, the magnitude of per capita production and consumption, the technical equipment and productivity of social labor, and t branch structure of social production — is decisi for characterizing the level of economic development. But this does not mean that in comparing levels of economic development the indices of a country's economic power may be disregarded. The correlation of this power plays an important part in economic and political competition betwe the two world economic systems.

To catch up with and outstrip the wealthiest capitalist country — the United States — means t surpass it in all of the basic indices which chara terize the level of a country's economic development. As the USSR has a larger population than the United States, it will naturally outstrip the United States first in the production capacity of t economy and later in per capita output.

What is the relationship between the level of t USSR's economic development and that of the chi capitalist countries, primarily the United States Let us examine the basic data characterizing thi lationship.

Population. The USSR in January 1961 had a pulation of 216 million, the USA (December 60) — 182 million, Great Britain (1960) — 52.5 illion, the Federal Republic of Germany (October 60) — about 53.7 million and France (January 1, 61) — 45.7 million. The Soviet Union's labor tential is higher than that of the United States, d it exceeds the combined labor potential of the ree most important capitalist countries of Eu- pe. The USSR's superiority in labor resources ll keep increasing as a result of the fact that the te of natural increase of its population is higher an that of any of the chief capitalist countries articularly in Europe).

Natural Increase in Population (in %)*

	1956	1957	1958	1959	1960
SR	17.6	17.6	18.1	17.4	17.7
A	15.5	15.4	14.8	14.7	14.2**
itain	4.4	5.0	5.1	5.2	6.3**
G	5.3	5.7	6.2	6.8	6.5**
ance	6.0	6.5	7.0	7.1	6.6

See *Narodnoe Khoziaistvo SSSR v 1959 Godu. tisticheskii Ezhegodnik*, Gosstatizdat, 1960, p. 5; *SSSR v Tsifrakh v 1960 Godu Kratkii Statis- heskii Sbornik*, Gosstatizdat, 1961, p. 353.

Figures for January-November 1960 calculated an annual basis. (*Monthly Bulletin of Statistics*, ited Nations, New York, February 1961, pp. 7,)

The 1959 census showed that despite war losses USSR population of working age (men between and 59 and women between 16 and 54 numbered ,800,000, or 17% more than in 1939. True, to the drop in the birth rate during the war rs the increase in the number of those able to rk will slow down somewhat in the immediate riod ahead, but the USSR's superiority in the mber of those able to work and employed will tinue not only over the three chief capitalist ntries of Europe, but also in comparison with United States, where the war did not adversely ect the dynamics and age structure of the popu- ion. This can be explained not only by the larg- population of the USSR, but primarily by the ler use made of the able-bodied part of the pop- tion, in particular, of women. In the near fu- e, when those born since the war reach working , the number of the population of working age l rapidly increase. Thus, although the war of 1941-1945 greatly affected the labor potential of our country, there can be no question of its superiority in this sphere over any of the developed capitalist countries. It should be pointed out that because there is no unemployment in the USSR and almost twice as many women are employed as compared with the United States, our country's superiority in the number employed will be considerably greater than with respect to total labor resources. It is important to note the growth in the number of those employed in industry and construction — the key branches in contemporary economic development; the number employed in industry and construction in the USSR reached 25 million in 1959, as against 19.6 million in the United States, 11.7 million in Britain and 11.7 million in the FRG. (2)

Education is an essential condition for a rapid rise in the level of a country's economic development, particularly specialized education. According to the 1959 census the number of persons with a higher, incomplete higher or specialized secondary education was 13,400,000 or more than 9% of the total population of the USSR over 16 years of age. In 1960 the country had 1,080,000 graduate engineers employed in the national economy, as against 525,000 in the United States. (3)

While a break-down of the population according to skills and their distribution among branches of the economy is one of the indices of the level of economic development, the total number of the population, including those able to work and employed, influences the economic power of a country, determining the possible volume of social production with a given labor productivity. The number and structure of the population also has a definite influence on the volume of needs for various kinds of goods and services, schools, hospitals, and so on.

At the present level of development of the productive forces the main source of expanding production is the growth of labor productivity, and an increase in the volume of consumption is determined primarily by higher norms of per capita consumption. Under these conditions the rate of population increase cannot be regarded as a decisive factor in expanded reproduction. That is why the tendency for the rate of natural increase in population to slow down, to which bourgeois economists attach paramount importance in their theories of "economic maturity" could not materially affect the course of economic development. However the fact of the matter is that this trend is by no means as absolute as it is sometimes pictured. The rate of natural increase changes depends upon the social-economic and concrete historical conditions of development of countries and peoples, even of those having the same social

	USSR	USA	Britain	FRG	France
Rated capacity of electric power stations (in million kw.)	59.3 (1959)	174.1* (1959)	32.7**	22.8**	18.8**
Power resources of agriculture (in million hp.)	141.1 (1959)	282.3*** (1950)			
of which:					
tractors	43.6	68.0			
combine motors	21.6	—			
electric motors	10.4****	22.0			

* *Statistical Abstract of the United States*, 1960, p. 527.

** Data for 1958 taken from *Statistical Yearbook 1959*, United Nations, New York, 1960, pp. 279, 280.

*** Of which 84 million hp. are for passenger cars; without the latter the power resources of the USA's agriculture were roughly 200 million hp. (McColly H. F. and Martin I. W., *Introduction to Agricultural Engineering*, New York, 1955, p. 147.) Data on the capacity of all agricultural power resources of U. S. agriculture are available only for 1950, and of the changes that followed we know only that the number of tractors, exclusive of those used in truck gardening, increased between January 1, 1950 and January 1, 1959 by 39.9%, trucks by 38.6% and passenger cars by 1.4%. (*Statistical Abstract of the United States*, 1960, p. 643.)

**** In the statistical annual *Narodnoe Khoziaistvo SSSR v 1959 Godu*, the capacity of electric installations is given together with other mechanical engines which were not given in the column headed: tractors, combine motors and motor vehicles (p. 415).

structure. Under capitalism, the natural movement of population is greatly influenced, apart from wars, by economic crises and the dynamics of employment. In some capitalist countries the rate of natural increase of the population has gone up in the postwar years as compared with the period between the two world wars. However the course of capitalist reproduction in the postwar period was determined not by the increase in population but by the renewal of fixed capital and militarization of the economy. Attempts to seek the reason for the lower rate of economic development in the epoch of imperialism in the decline in the rate of increase of population are completely unfounded.

Under socialism, with its inherent full employment, the growth of population influences the rate of expanded reproduction far more than under capitalism. The high rate of natural increase of population in socialist countries is not due to insufficient "economic maturity," but to the new social and economic conditions of life of the mas es. Of course it is not the increase of populatio but the increase in labor productivity that determines the high rate of development of the sociali economy. However the high rate of natural increase of the USSR population is an additional factor favoring the country's economic development. Along with the intensive growth of labor productivity, it plays an important role in achiev ing large absolute increases in production. The combination of a high level and rapid rate of economic development gives rise, even with our rat of increase of labor productivity, to the need of recruiting man power for the national economy, pecially for industry.

The need for new man power becomes greater owing to the gradual reduction in the work day a week and the increase (at least at certain stages elopment of socialist society) in the proportion he aggregate working time given to the non-pro-tive sphere.

The power capacity of the national economy ves as one of the most common criteria of a ntry's technical development. The above table es data covering the power capacity of individual nches of the national economy of the USSR and chief capitalist countries.

More than 90% of the power capacity of the United tes is accounted for by automotive-vehicle tors, the bulk of which are those of passenger s and buses, in other words, transportation ans in the non-productive sphere. In the USSR proportion of power capacity of motor vehicles he total capacity of primary engines is much s. However, if we compare power capacities in productive sphere alone, the USSR is still far nind the United States. One of the chief tasks of USSR's peaceful economic competition with the ited States is to increase rapidly in the coming riod the power capacities of the entire national nomy.

The capacity of electric power stations character-s mainly the extent of development of the power se of industry and the municipal economies of the ies. Our country is far ahead of the European italist countries in the absolute magnitude of ductive power facilities. However the per capita acity of electric power stations in the developed ropean countries is higher than in the USSR and must catch up with them in this area.

The USSR has also left the Western European italist countries far behind with respect to the solute capacity of agricultural power facilities. gures on the number of tractors bears this out. of July 1, 1960 Soviet agriculture had 1,921,000 ctors (in terms of 15 hp. each), while at the end 1958 Britain had in use 433,900 tractors of more n 10 hp. each; FRG — 695,700 and France — ,600. If we compare the aggregate capacity of tractors rather than their number, the result l be still more favorable for the USSR, for in the ropean capitalist countries a large number of -power tractors (under 15 hp.) are used. Thus capacity of tractors used in Soviet agriculture greater than in the three main capitalist coun-es of Europe combined.

Metal Availability in the National Economy.

r many decades the principal material used in production of instruments of labor and many icles of consumption has been ferrous metals, a considerable part of a country's social wealth ears in the form of its metal stock. At the end 1938 the metal stock of the USSR amounted to % of that of the United States and 54.4% of that Germany (4) An indirect idea of the progress de since then can be gained by comparing the ume of steel output in different countries in the postwar years. Between 1946 and 1960 steel output in the USSR was 567.8 million tons, in the United States — 1,302.8 million, in Britain — 266.6 million and in the FRG — 246.3 million tons. As is generally known, the national economy gets steel in the form of rolled metal, most of which is processed further. A large, though varying part of the machined metal in the different countries is turned into scrap, which makes up the store of so-called secondary metal. Moreover the ratio of net exports from the USSR and the capitalist countries of ferrous metals (in the shape of raw material and manufactured articles) to their total metal balance sheet is not the same. Therefore the magnitude of the increase in the metal stock cannot be determined exactly from the metal output. Nevertheless there can be no question that in terms of the volume of the metal stock the USSR has come much closer to the United States and is ahead of Britain and the FRG.

The 15 years that have elapsed since the war are enough of a span for the bulk of the metal stock to have been renewed. For this reason data on the relationship of steel output for the 15 years give a fair idea of the changes in the relationship of the metal stock of the USSR and that of the chief capitalist countries. It can be stated with confidence that with respect to metal stock the Soviet Union belongs among the countries with a high level of economic development, even though in this sphere it is still behind the United States. In estimating the prospects of growth of our country's metal stock we should bear in mind the changes in the raw-material balance sheet resulting from technical progress, the replacement of ferrous metals by aluminum and plastics. The Soviet Union will win out in the economic competition with capitalism with a different structure of social wealth than the United States. Apparently the present level of American production and consumption will be attained with a relatively smaller volume of metal stock, and that will be proof of the higher technical level of our economy.

A comparison between the social wealth of the USSR, the USA and other countries entails serious difficulties. The attempt to estimate the relationship of the social wealth of the USSR and the USA undertaken by Academician S. G. Strumilin (5) is based on the calculation of the social wealth of Russia in 1913 and the rate of increase in the fixed capital of the national economy between 1913 and 1955. According to these calculations, the social wealth of the USSR in 1956 amounted to 45% of that of the United States. The reappraisal of our country's fixed capital made at the end of 1959 permits a direct comparison between a large part of the social wealth of the USSR and the USA. The value of the productive and non-productive fixed capital of the USSR as of January 1, 1960 amounted to 296.47 billion rubles. (6) That part of the national wealth of the United States which consists of buildings and other structures and industrial equipment was estimated in 1958 at a residual value of 1,033 billion dollars in current prices. (7) The residual value of the fixed capital of the USSR amounts to 75% of their replacement value. Buildings and other structures and equipment predominate in the fixed productive capital. Only 1.9% of the value of fixed capital which has been reappraised covers perennial plants and livestock. If we take into account the fact that the value of the ruble with reference to the dollar in fixed capital is higher than its purchasing power with respect to means of production and articles of consumption combined, the value of the USSR's fixed capital at the beginning of 1960 was roughly 40 to 42% of the value of the corresponding part of the national wealth of the United States. The figure obtained from this calculation comes closer to Academician Strumilin's estimate. It may be considered that the per capita social wealth of the USSR in 1959 came to approximately 35% of that of the United States. It should be noted that the United States suffered no military destruction in either the first or second world wars.

National Income. The 1959 national income of the United States was estimated by American statisticians at 396.6 billion dollars. If we deduct secondary incomes of individuals and institutions in the service industries and those in government service, the real size of the national income of th USA may be taken as 297.5 billion dollars, or about 270 billion rubles. The national income of the USSR in 1959 was roughly 130 billion rubles, or approximately half of America's. Taking into account the larger population of the USSR the per capita national income of the USSR in 1959 was better than 40% of that of the United States. The considerable lag of the Soviet Union with respect t this index by no means can serve as a basis for counting our country among the "immature" countries, as Colin Clark and several other bourgeois economists and statisticians once tried to do. Th do not count Britain and the FRG among the "immature" countries, yet the national income of the USSR in 1958 was 3.4 times greater than that of Britain and almost 4 times greater than that of the FRG. (In this calculation the national income of the Western European countries was arrived at after excluding income in the non-productive

	1960	1959		
	USSR in % of USA	USSR in % of Britain	FRG	France
Steel	61	72	57	84
Coal, oil and gas (in terms of conventional fuel)	46*	73	104	218
of which:				
coal	97	52	70	158
oil	36	—	—	—
gas**	12	71	255	145
Electric power (released from busbar)	27	54	62	82
Cement	72	75	40	58
Artificial and synthetic fiber	23	19	16	27
Cotton fabrics	51	99	92	84
Woolen fabrics	107	35	67	56
Leather footwear	51	69***	115***	108***
Sugar - granulated	(1959) 212	205	121	131

* Coal and oil figures are for 1960, and those for gas for 1959.
** 1959
*** 1958

ere, which is secondary income not included by
statisticians in the total amount of net output of
national economy.) With respect to per capita
ome, the national income of the USSR amounted
nore than four-fifths of the national income of
tain and was equal to that of Western Germany.
t is a very important summary index of the
level of the Soviet Union's economic develop-
nt.

n the USSR there is less net industrial output
head of population, and agriculture plays a far
ater part in the production of the national in-
ne. Thus in Britain agriculture accounted for
ghly 6% of its national income, while in the
R it accounted for 20.9%. (8) Therefore the
erence in per capita industrial output in the
R and Britain is somewhat greater than in the
capita national income. There is every reason
elieve that already in the current Seven-Year
n period the USSR will pass Britain in both na-
al income and industrial output per head of
ulation.

o ensure the highest level of consumption in
world it is necessary to greatly exceed the
erican level of national income per head of pop-
ion, since the rate of accumulation is much
her in the USSR than in the USA and the
capitalist countries of Western Europe. In the USSR forms of distribution based on the existence of antagonistic classes have been eliminated, and the USSR will therefore pass the United States with respect to the consumption level of the working people earlier than for the average rate of consumption of the population as a whole. However to attain the highest living standard in the world it is necessary to exceed the average living standard not only of the working people of the United States but of the population as a whole, and this presupposes a substantially higher per capita national income than that of the United States.

Industrial and Agricultural Production. Industrial output in the USSR in 1960 was better than 50% of that of the United States. (9) Rough calculations, based on data on the volume of industrial output of the capitalist countries of Europe and the United States, permit the conclusion that industrial output of the Soviet Union is approximately three times that of Britain, roughly 2.5 times that of the FRG, and four or five times that of France. A comparison of the volume of output for the principal industrial products in physical terms supports this estimate (see table immediately below).

Figures on per capita output of principal industrial products are given in the table on page 54.

Output of Principal Industrial Products in the USSR and the Chief Capitalist Countries

	USSR		USA	Britain	FRG	France
	1959	1960	1960	1959	1959	1959
lectric power consumption i industry (billion kwh.)	173.3	—	400.7 (1959)	55.2	65.4	41.4
SSR in % of respective ountries	—	—	43	314	265	418
Production of Means of Production						
eel (million tons)	60	65.3	90.1	20.5	25.8	15.2
SSR in % of respective ountries*	—	—	72.5	293	232.5	395
oal, oil and gas (in terms of onventional fuel; million tons)**	668.0	715	1,283***	225.5	158.5	65.9
SSR in % of respective ountries	—	—	55.7	296	421	1,014
ectric power (billion kwh.)	265	292	—	121	102	—
me — released from busbar illion kwh.)	249	274	844	114	98	65
SSR in % of respective countries	—	—	32.5	218	254	383

Output of Principal Industrial Products in the USSR and the Chief Capitalist Countries (continued)

	USSR 1959	USSR 1960	USA 1960	Britain 1959	FRG 1959	Franc 1959
Cement (million tons) USSR in % of respective countries	38.8 —	45.5 —	53.3 85	12.8 303	23.7 164	14.2 273
Artificial and synthetic fiber (thousand tons) USSR in % of respective countries	179 —	211 —	784 27	233 77	278 64	143 125
Production of Articles of Consumption						
Cotton fabrics (unbleached) (million sq. m.) USSR in % of respective countries	4,978 —	5,214 —	8,550 61	1,240 401	1,335 373	1,259 395
Woolens (million running meters) USSR in % of respective countries	328 —	342 —	275 124	233 141	120 273	126 260
Leather footwear USSR in % of respective countries	356.4 (1958) —	389 (1959) —	640 (1959) 61	138 (1958) 258	84.8 (1958) 420	74.4 (1958 479
Sugar (million tons) USSR in % of respective countries	6.0 —	6.4 —	2.6**** 246	0.7 857	1.2 500	1.0 600

* The relative figures given in the table here and later were obtained by using 1960 data for the USSR and USA and 1959 data for the European countries.

** The basis for the evaluation is as follows: one ton of coal = one ton of conventional fuel; one ton of oil = 1.429 tons of conventional fuel and 1,000 cu.m. of natural gas = 1,257 tons of conventional fuel

*** Coal and oil according to figures for 1960, and gas figures in 1959.

**** Including sugar produced on the Hawaiian Islands, which became a part of the United States in 1959, the total sugar output in the USA in 1960 was 3.4 million tons.

Consumption of electric power by Soviet industry in 1959 was better than two-fifths the amount consumed by USA industry, and was roughly equal to industrial consumption in Britain, the FRG and France put together. In 1960 steel output in the Soviet Union was 72.5% of that of the United State cement output — more than 85%, and production c all types of fuel — more than one-half of their re pective outputs in the USA. The number of mach tools in our country was almost equal to the numb

he United States. Consumption of electricity by
ustry, steel output, production of all types of
, electric power output and a number of other
duction indices afford grounds for believing
, on the whole, the scale of industrial produc-
in the USSR is probably only a little less than
of Britain, the FRG and France combined.
s regards total industrial output per head of
ulation the USSR is behind the USA by approxi-
ely 50%. Our country is also behind the chief
opean capitalist countries, although with res-
t to a number of major industrial products it
much ahead of them. Britain, the FRG and
nce do not produce some industrial items at
and the production of others is insignificant.
instance Britain practically has no timber
oil extraction industries, and the FRG meets
requirements in iron ore, oil, timber, cellu-
e and some other items largely through imports.
Britain, the FRG and France production of a
ber of non-ferrous metals, primary process-
of certain agricultural products, and so on,
nonexistent or little developed.

Implementation of the basic economic task of the USSR, and carrying out the tasks for the comprehensive building of communism require a sharp increase in per capita industrial output. However the volume of industrial output already attained makes it possible to solve major economic and scientific problems which even the chief Western European countries are unable to cope with, since they are considerably behind the USSR in absolute output. The planned socialist system of economy permits the most effective use of economic resources.

With respect to the volume of agricultural output, the USSR is substantially ahead of all capitalist countries in Europe, where a considerable proportion of the consumption of agricultural products is met by imports. As far as the United States is concerned, the USSR is much less behind it in volume of agricultural production than in industrial output. In 1959 our country produced 20 to 25% less farm produce than the USA, and roughly 30% less per head of population. (10) While lagging behind the United States in production

Rise in the Annual Volume of Industrial Production and
Capital Investments in the USSR

	Increase per decade		Growth for 1951-1960 compared to 1931-1940
	1931-1940	1951-1960	
Pig iron production (million tons)	9.9	27.6	3 times
Steel production (million tons)	12.5	38.0	3 times
Coal production (million tons	118.1	252.1	2.1 times
Oil production (million tons)	12.6	110.0	8.7 times
Electric power output (billion kwh.)	39.9	200.8	5 times
Production output of metal cutting machine tools (thousands)	50.4	83.1	1.6 times
Production output of mineral fertilizers (million tons)	2.7	8.3	3.1 times
Cement production (million tons)	2.7	35.3	13.1 times
Capital investments in the national economy by the state (billion rubles)	3.3	21.0	6.4 times

of maize, cotton, meat, eggs, fruits and vegetables, the USSR is ahead of it in the production of wheat, potatoes, sugar-beet, milk, butter and wool. As regards the latter two items American per-capita production norms too have been exceeded. In 1960 per capita production of wheat in the USSR was 298 kg. and in the United States — 206 kg., and of potatoes — 392 and 65 respectively. However the USA produced 2.3 times more meat per head of population than our country. The present structure of agricultural production in the USSR, with its high proportion of grain and potatoes, is gradually changing in favor of animal husbandry products — milk, butter, meat and eggs. (11) Despite these advances, however, Soviet agriculture still lags behind the growing requirements of the population in foodstuffs and of industry in raw materials. An accelerated rise in agricultural production remains one of the most pressing problems of the Soviet Union's economic development.

Annual Absolute Increases in the National Income, and in Industrial and Agricultural Production are very important indices of economic power. They reflect the ability of the particular country and the social system of economy prevailing in it to raise output volume. A characteristic feature of socialist expanded reproduction is that these increases regularly rise with growth in the level of economic development, while under capitalism they often decline in individual years and even over whole periods.

The figures in the table on page 57 show a high rate of increase in the annual volume of output for the 1951-1960 decade as compared with the 1931-1940 period. A similar process is also going on in the current Seven-Year Plan period.

The Soviet rate of expanded reproduction is much higher than in the capitalist countries. Ho ever a higher rate of production growth does not in itself signify larger absolute increases; the latter also depends on the absolute level of production. With the output volume of the more important industrial products attained at the present time, the USSR's superiority in rates of growth ensures bigger annual absolute increases in industrial output than in the chief capitalist countries, including the United States. Higher annual increases in output with a smaller absolut volume show more than superiority in growth rates. They also testify to the fact that we have the economic resources required to ensure the absolute increases in output attained in our country.

Production Capacities Put into Operation as a Result of Capital Construction

	1951-1958	1959-1965 (control figures)
Pig iron production (million tons)	16.3	24-30
Steel production (million tons)	12.4	28-36
Coal production (million tons)	184.9	200-220
Electric power stations (billion kw.)	31.5	58-60
Looms (installation) (thousands)	51.1	150.3
Leather footwear production (million pairs)	61.0	137.0
Railways of general use (construction) (km.)	4,118	9,000 (approximately)

The national income of the USSR in 1959 was roughly 50% of that of the USA, but it's growth rate in our country is approximately four times as great; the absolute increases in national income are therefore roughly double that of the USA. Soviet industry has attained more than one-half the volume of American industrial output. The average annual growth rate of industry between 1954 and 1960 was 4.4 times as high in the USSR as in the USA Thus the absolute annu increase of industrial production in the USSR is approximately 2.5 times as high as that of the United States. This is confirmed by comparing the increases in output of the principal types of industrial products in physical terms. Between 1954 and 1960 the average annual absolute increase in the output of steel was 3.9 million

s in the USSR, while in the USA steel output
the same period dropped on the average by 1.6
llion tons a year. The output of cement in the
SR went up annually by 4.2 million tons on the
erage, and in the USA by 1.2 million; the cor-
sponding figures for oil are 13.6 million and
million tons. Coal production went up in the
SR by 24.2 million tons and in the United States
dropped 7.8 million. It is only with respect to
me types of industrial items that the USA is
ll ahead in average annual absolute increases.
ese include electric power output (released
m busbar), which increased in the USSR by
1 billion kwh. and in the United States by 47.1
lion, and gas — 5.6 billion cu. m. and 13.9 bil-
n cu. m. respectively (1954-1959).

With respect to gross agricultural output the
iet Union is 20 to 25% behind the United States,
the average annual rate of increase between
54 and 1960 was 2.6 times as high as in the
ited States (6.2 and 2.4% respectively). As
absolute increases in agricultural output for
s period, the USSR outstripped the United
tes by 100%.

The Soviet Union has reached a level of eco-
nic development under which, making use of
advantages of socialism, it can annually draw
its economic turnover far more resources
n the United States, not to speak of the other
italist countries.

The Structure of the Social Product. An im-
rtant index of economic development under con-
ions of machine technology is the ratio of out-
of the means of production to articles of con-
nption in the national economy as a whole
in industry. The proportion of the means
production in the social product reflects the
le of production of modern machinery and in-
ences decisively the technical level of the en-
national economy and the level of productivity
social labor.

Technical progress and the growing role played
industry in the national economy lead to a high-
proportion of means of production in the social
duct. In all countries which have developed
ge-scale industry and transportation facilities
producing their own means of production, capi-
st industrialization was accompanied by a
hly intensive growth of the proportion of Depart-
nt I. To illustrate, in the United States pro-
tion of means of production (instruments of
or and raw materials) increased more than 3.4
es between 1868 and 1900, and production of
icles of consumption — 2.9 times; the corres-
ding figures for the period between 1900 and
9 were 2.3 and 1.6 times. (12)

The capitalist countries attained their present
portion of means of production in the social
industrial product as a result of many decades
of industrial development. Socialist industrialization in our country has led to fundamental advances in the ratio of production of means of production to articles of consumption in a brief historical span. In 1959 the proportion of means of production in the industrial output of the USSR was about 72%. We may consider the proportion of means of production in the total social product to be somewhat above 60%.

In view of the differences in the methods of calculating the social product and the output of individual branches, a comparison of the ratio of Departments I to II in the USSR and capitalist countries can be only tentative. According to an estimate by the American Econometric Institute based on the net output method, in 1956 means of production made up 57.6% of the output of American industry. (13) If, however, the output volume is estimated by the value of gross output, as is done by our statisticians, then according to calculation by the Statistics Sector of the Institute of Economics of the USSR Academy of Sciences, the proportion of means of production in the total volume of US industrial output would be 60%. Analysis of the structure of the national economy according to the number of workers shows that the proportion of branches in Soviet industry producing means of production in 1959 was better than 70%. In the industries of the more developed capitalist countries it varies between 55 and 60%. In the USSR, as well as in the USA, the FRG and Britain, the first place among branches of industry is held by the machine-building and metalworking industries. Another proof of the development of key branches of industry is the fact that the USSR has become a big exporter of machines and other equipment. In 1959 machinery and other equipment made up 21.5% of total exports as against 0.1% in 1928 and 5% in 1938.

The rise in the level of economic development in the USSR in the years of Soviet rule manifested itself also in the changes in the structure of the employed population.

The USSR was on the same level as the USA in the proportion of those employed in industry, construction, transport and communications enterprises in the total number employed in the national economy as a whole: in the USSR in 1959 these industries accounted for 39% of all employed, and in the United States — 41.1%. (14) However in the USSR the proportion of those employed in agriculture is still high (41% of the population, including those employed in forestry), and the services sector is inadequately developed. Engaged in US agriculture (not including forestry) are only some 10.1% of the total labor force (exclusive of those in the armed services, but inclusive of those working part

Distribution of Population Employed in the National Economy of the USSR
(exclusive of students and those in the
armed services; in % of total)

	1913	1928	1937	1955	1959
Agriculture and forestry (including subsidiary husbandry)	75	80	56	43	41
Non-agricultural spheres, including	25	20	44	57	59
industry, construction, transport and communications	11	10	29	37	39

time). In Britain the corresponding figure is 3%. (15)

The present distribution of the population between the agricultural and non-agricultural sectors, which is an index of the inadequate level of productivity of farm labor, lowers the level of productivity of all social labor. As a result of capitalist industrialization and urbanization, such countries as Germany and, in particular, Britain meet a large part of their requirements in agricultural products through imports (Britain imports as much as half of its requirements). The socialist industrialization of the USSR was carried out in the 1920's and 1930's with a far higher level of productive forces and labor productivity than that of the capitalist industrialization of the 19th century. Consequently it required relatively less redistribution of labor resources from country to town. Today's intensive industrial development of the USSR is proceeding under conditions in which the increase in industrial output is being achieved mainly through rising labor productivity, and the need for labor power for the cities is being met to a large extent through the natural increase in the able-bodied city population.

This of course does not mean that the industrial development of the USSR did not involve fundamental changes in the distribution of the population between town and country. On December 17, 1926 the urban population amounted to 18% of the total, on January 17, 1939 — 33%, and on January 15, 1959 — 48%. However the fact remains that the USSR reached its present high level of economic development with a relatively smaller proportion of non-agricultural population than the chief capitalist countries.

The USSR's experience again raises the question of the indices of a country's economic development. A high proportion of population engaged in agriculture is generally regarded as one of the chief signs of a country's economic "immaturity." In fact this index does even today testify to the backward economic structure of a number of countries. But every truth is concrete. A relatively high proportion employed in agriculture where industry and industrial production of the means of production are underdeveloped is one thing, but it is quite another thing when, despite the high proportion employed in agriculture, a high level has been reached in the development of production of modern means of production as well as of industry as a whole.

Therefore the structure of the national econom of the USSR as a whole is developed. This of course does not mean that there will be no furthe redistribution of labor resources from agriculture to the non-agricultural sector in the USSR. On the contrary, solution of the great tasks involved in the communist transformation of socie in the USSR presupposes such a redistribution. The process of converting agricultural labor into a variety of industrial labor and the further development of collective farm property, ultimately bringing it up to the level of property belonging to the whole nation, are creating the conditions for a regular rise in labor productivi in agriculture and the freeing of large resource of manpower from it. The Soviet Union will equal or come close to equalling the United States in the ratio of non-agricultural populatio to the total number of people employed in the national economy with a much higher level of economic development than that of America today.

Productivity of Social Labor. The difference in the level of economic development is stalized in the relation of levels of productivity ocial labor. The national income of the USSR 959 was, as has already been stated, roughly -half of that of the United States, and the num- employed in the productive sphere was approx- tely one and one-half times the number in the ted States. (16) Productivity of social labor he USSR national economy was 2.5 to 3 times er than in the United States, which is partly result of the large number of people employed griculture. The production of national income worker in agriculture is much less than in stry. However this comparison does not take account the squandering of labor on a social le which is characteristic of capitalism. The erence in the ratio of national income per em- ed person to per head of population permits east a partial calculation of these losses. We t remember that in 1960 the national income head of population in the USSR was better than -fifths of the American level. Taking into ac- nt the losses of social labor inherent in capital- production the ratio of productivity of social r is more favorable for the USSR.

oviet economists and statisticians have made mparison in recent years of the level of labor ductivity in the industry and agriculture of the R and the capitalist countries. The discrep- ies in calculating the ratios of labor productiv- levels in industry were not very significant. y were greater in calculating labor productiv- levels in agriculture, due to the different esti- es of the number of persons engaged in agri- ure in the USA and the USSR. All calculations w that the USSR is far ahead of British and nch industry in labor productivity. It therefore upies first place in Europe and the rest of the ld (except for the United States) in terms of strial labor productivity. Comrade ushchev noted at the 21st Party Congress that lay labor productivity in US industry is higher in ours by roughly 2 or 2.5 times, and in iculture by approximately 3 times." This o of labor productivity in the USSR and the should change materially during the current en-Year Plan period. Labor productivity in stry increased by 12.8% during the first two rs (1959-1960) of the Seven-Year Plan (with orter working day) or by 5.2% per year on average. This rate is much higher than the rage annual rate of growth of labor productiv- n American industry.

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et us sum up the results of the comparative ysis of the economic power and economic de- pment level of the USSR and the chief capitalist ntries. The absolute size of the productive es, the social product and national income, of industrial and agricultural output have enabled the Soviet Union to occupy second place in the world in economic power. In terms of such an important index of a country's economic power as the average annual absolute increase in the social product, national income and industrial output, our country is firmly holding first place in the world. The level of economic development of the USSR is also very high. For production of national income per head of population our country is close to Britain and is at the same level as the FRG, and for labor productivity in industry it occupies one of the top places in the world. The proportion of production of means of production in the USSR national economy and particularly in its industry is very high, which creates the conditions of accumulating fixed and working capital on an exceptionally large scale. The proportion of means of production in the industrial product is higher in our country than in any capitalist country.

The great scientific achievements of the USSR in mastering space, atomic and thermonuclear energy and others of the more promising branches of modern science and technology are due to the high level not only of scientific but also of economic development, and to the availability of vast economic resources, skilled personnel, high-grade metallurgy, precision machine-building, radio-electronics, automation, electronic computing technique, and so on.

A statement of the high level of our country's economic development is not of course intended to produce complacency; it is necessary for an estimate of the possibilities available to the USSR in implementing its basic economic task and creating the material and technical base of communism. The possibilities are immense. But it is necessary to know the measure of success and the size of the tasks in the economic competition with capitalism. Earlier we showed the difference in the levels of economic development of the USSR and the USA which should be eliminated in the briefest historical span of time.

No social structure can manifest its superiority fully unless it surpasses the highest level of economic development attained by the structure preceding it. To achieve the highest level of popular consumption in the world and solve all the basic problems involved in the communist transformation of society, the level of economic development of the USSR and all the socialist countries must rise further. The advantages of socialism and high rates of socialist expanded reproduction are a guarantee of an early victory in the economic competition with capitalism.

Footnotes

1. Calculated on the basis of figures given by the Monthly Bulletin of Statistics, United Nations,

New York, February 1961, pp. 1-6, 160-161, 164-169.

2. The number employed in industry in the USA, Britain and the FRG do not include those working in public utility enterprises (electric power stations and so on), but if proper adjustment is made, the general conclusion drawn from the figures cited in the text would not change.

3. See SSSR v Tsifrakh v 1960 Godu, p. 314.

4. Problemy Ekonomiki, 1940, No. 10, p. 48.

5. See Strumilin's introduction in A. L. Weinstein, Narodnoe Bogatstvo i Narodno-khoziaistvennoe Nakoplenie Predrevoliutsionnoi Rossii, Gosstatizdat, 1960, p. 8.

6. See Narodnoe Khoziastvo SSSR v 1959 Godu, p. 69.

7. The value of fixed capital was obtained by totaling the value of buildings and equipment (Statistical Abstract of the United States, 1960, p. 326).

8. R. Schweizer, Die Einkommensdisparität Zwischen der Landwirtschaft und der Industrie, 1958, p. 8. The data for the USSR are taken from Narodnoe Khoziastvo SSSR v 1959, Godu, p. 78.

9. As calculated by SSSR v Tsifrakh v 1960 Godu (p. 105) Soviet industrial output was roughly 60% of that of the USA.

10. See SSSR v Tsifrakh v 1960 Godu, p.105.

11. Between 1953 and 1960 per capita production of meat (in slaughter weight) went up from 31 to 41 kg., milk, from 192 to 287 kg., butter, from 2.6 to 4 kg., and eggs from 85 to 124 pieces.

12. Computed on the basis of figures cited in Jurgen Kuczynski's article "Zur Geschichte der Erweiterten Reproduktion unter dem Kapitalismus" (Probleme der Politischen Ökonomie," Berlin, 1957, pp. 19-20).

13. C. Roos, Dynamics of Economic Growth: The American Economy 1957-1975, New York, 1957.

14. Calculated on the basis of figures given in Statistical Abstract of the United States, 1960, p 205, 209. American statisticians count as employed those who have performed any sort of wor (for pay or income) during the week in which the data were gathered, or worked without pay for no less than 15 hours in their own enterprise, and also persons who were jobless or looking for wor or had some job or their own business but were away temporarily during the week the study was made. Included in the total number engaged in civil pursuits were part-time workers; domestic are not included.

15. The figures for the USSR are taken from Narodnoe Khoziaistvo SSSR v 1959 Godu, p. 583; for the United States, from Statistical Abstract o the United States, 1960, pp.205, 209; for Britain, from Annual Abstract of Statistics, London, 1960 p. 106. Available statistics indicate that the rati of those employed in agriculture to total number employed was 16% in the FRG in 1958 (Statistiche Jahrbuch, 1960, 1960, p. 142), 29% in France in 1956 (Agricultural and Food Statistics, OEEC, Paris, 1959, p. 8).

16. The calculation for the USSR embraces those employed in industry (including members o producers cooperatives), in agriculture and fores ry (including those engaged in personal subsidiar husbandry), in construction, transport and communications, in trade, public catering, purchase of farm produce, and material and technical supp (see Narodnoe Khoziaistvo SSSR v 1959 Godu); an for the US, the number employed in all industry, in contact construction, agriculture (adjusted for defective calculation by American statistics of those engaged in agriculture), transport and communications enterprises, utilities and trade (mai ly based on data from Statistical Abstract of the United States, 1960, pp. 205, 229).

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